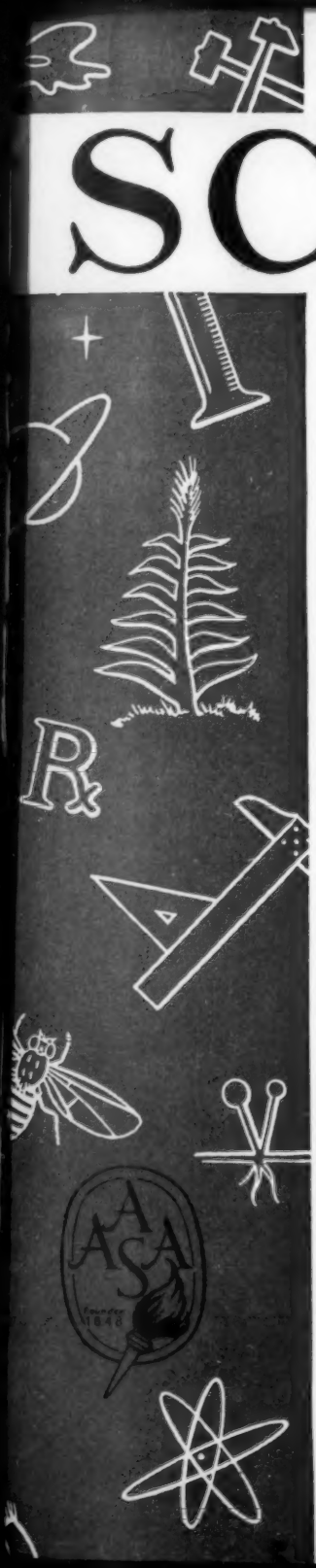

SCIENCE

FEBRUARY 20, 1953

VOLUME 117 NUMBER 3034

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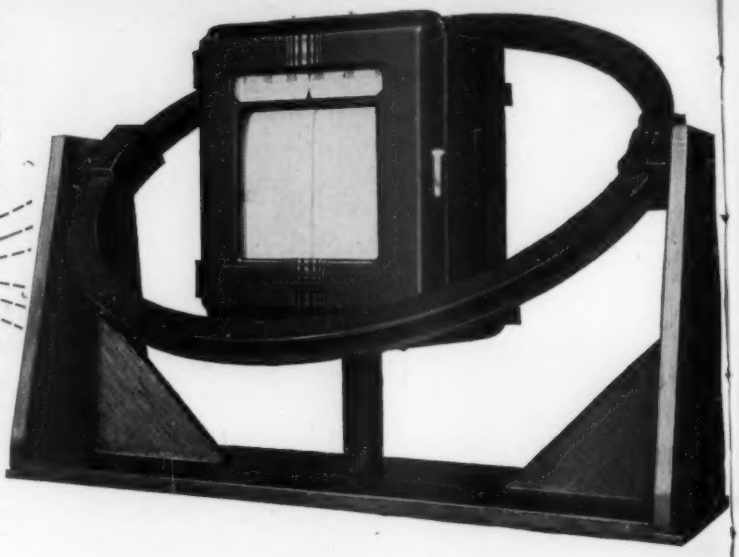

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Boston, 1953

THERE is no substance to the rumor that the AAAS staff relaxes or leaves on winter vacations as soon as the Christmas meeting of the Association is over. Work on the next annual meeting fits into the administration schedule as tightly and as quickly as an interchangeable part in a piece of machinery, which, with some adjustments for the new job to be done, continues to function with little more than a momentary pause.

The story of any annual meeting spreads over several years, as the case of Boston illustrates. As far back as the spring of 1950, Raymond L. Taylor studied The Hub's physical facilities and tentatively reserved all of them for Association use in December 1953. The AAAS Executive Committee designated Boston as the 1953 meeting place in October 1950; and promptly thereafter the tentative arrangements made by Dr. Taylor were confirmed. Correspondence was then started to stimulate thinking on the broader aspects of the program.

In late 1952, despite preoccupation with the final details of the St. Louis convention, the tempo was accelerated. Earl P. Stevenson, president of Arthur D. Little, Inc., agreed to serve as General Chairman of the Local Committee; and James B. Conant and James R. Killian readily agreed to work with Dr. Stevenson in the capacity of vice-chairmen. This situation was, of course, altered when Dr. Conant resigned from the presidency of Harvard to accept appointment as U. S. High Commissioner for Germany, but not before he had made several invaluable suggestions. Among them was the thought that, as a thread running through the fabric of the meeting, some such theme as "The Interface of Land and Sea" would enable the Association to make the most of the New England environment and of a special field of investigation in some of its institutions.

Meanwhile several affiliated societies have given thought to the feasibility of meeting with the Association at Boston, and a few—the American Society of Zoologists, the Society of Systematic Zoology, the American Society of Naturalists, Genetics Society of America, the American Society of Human Genetics, the science teachers, and others—have decided in favor of it, and at least a score more have indicated their interest in participating.

Although fewer than five weeks of 1953 have elapsed as this issue of SCIENCE goes to press, key posts on the Local Committee have been filled, the personnel of the Symposium Committee has been selected, meetings of these committees and their subcommittees have been scheduled for early March, floor plans and contracts for booth space at the Exposition are ready to go to the printer for distribution March 15, specific programs are taking form—and administrative thoughts wander, perhaps from force of habit, to the Golden Gate and 1954, where the machinery is running smoothly—although idling—in preparation for the Association's first national meeting on the Pacific rim.

If there is no substance to the rumor of post-convention relaxation for the staff, there is even less to the unfounded impression that the Association's meetings are "outmoded," that its "programs have grown 'thinner'." Neither facts nor figures bear out these defeatist statements. Where else but at a AAAS convention can engineers, biologists, psychologists, industrialists, physical scientists, and public leaders assemble to consider Disaster Recovery? Or the Interface of Land and Sea? Or Problems of the Pacific Rim? It is not the Association that lags, but those who fail to comprehend the scope and the impact of its current program. Intellectual bankruptcy and deterioration will indeed set in if the AAAS turns from programming important science merely to ballyhooing the importance of science.

HOWARD A. MEYERHOFF
Administrative Secretary

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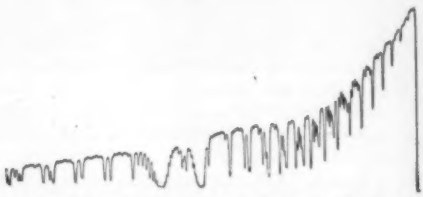

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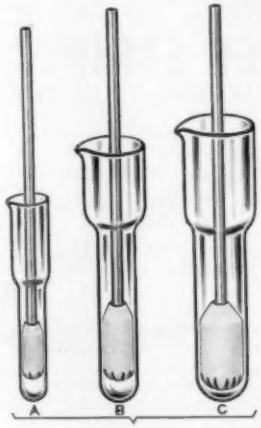

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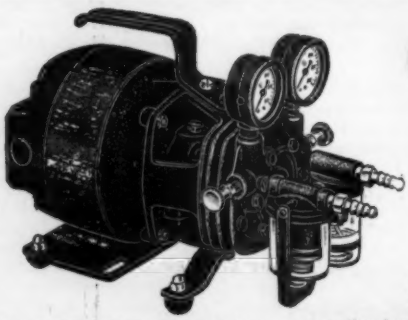

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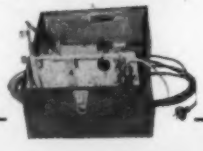

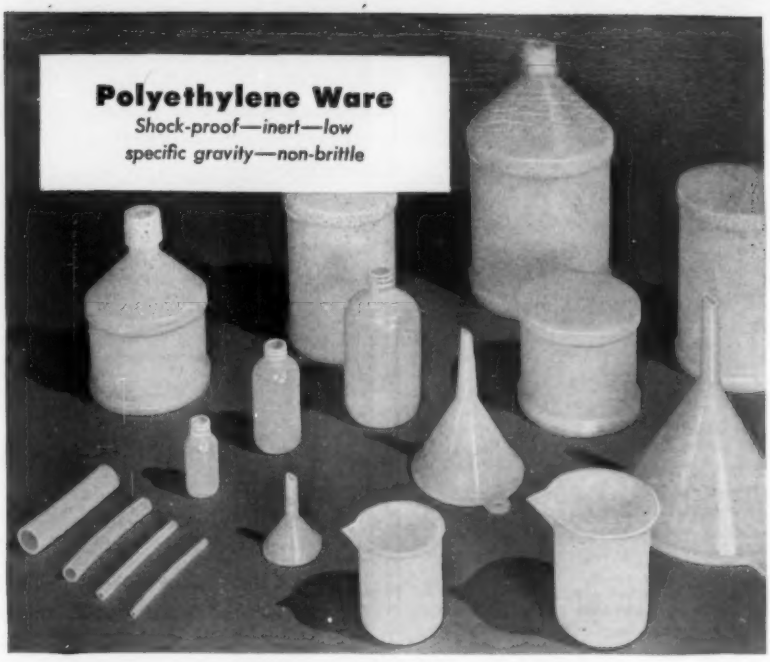

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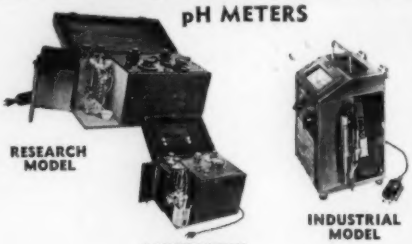

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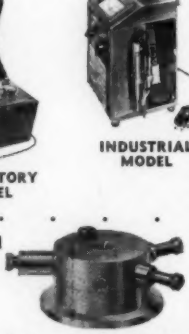

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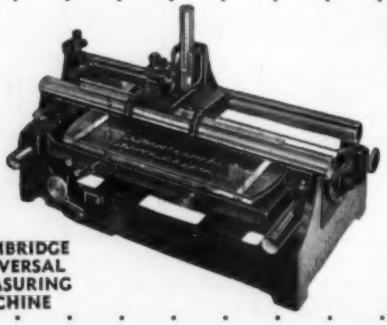

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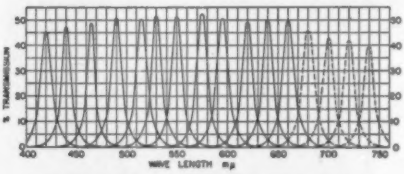

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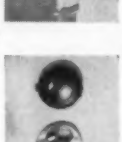

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The Common Ground of Science and Politics

Kirtley F. Mather

Department of Geology and Geography, Harvard University, Cambridge, Massachusetts

IT IS MY PURPOSE to speak along lines forecast by the healthy tradition that has lately been developed by my predecessors in this particular spot in the Annual Meeting of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Instead of discussing some specific problem or some notable progress within the field of geology, my special department of the physical and biological sciences, I shall consider certain of the broad problems arising from the impact of science on modern life. Such a procedure has become standard practice for retiring presidents ever since the last meeting of the Association in St. Louis, in 1946, when A. J. Carlson raised the question "Be There 'a Standard to which the Wise and the Honest Can Repair'?" Perhaps it will be appropriate to think of my address as a sequel to his.

At first thought, there are those who might cynically inquire, "Is there any common ground at all between two such antagonistic fields of activity as science and politics?" Conflicts between scientists and politicians have been so widely publicized in recent months that there might seem to be adequate basis for such a question. Scientists have criticized politicians for their ignorance of the strategy and procedures that have proved so efficient in the progress of science. Politicians have berated scientists for their impractical idealism and have even denounced them as subversive when they object to security regulations and procedures that seem to them inimical to the continuing development of scientific knowledge.

It is obvious, however, that America needs both wise and honest politicians and intelligent and conscientious scientists. Either vocation should deserve as much respect and receive as much honor as the other. In spite of the fact that there was no reference whatever to science in the platforms of either the Republican or the Democratic party, drafted in preparation for the 1952 political campaign, the politicians who phrased those platforms were well aware that the successful candidates would necessarily depend heavily upon the work of scientists for progress toward many of the objectives they promised to reach.

Scientific research and development have become a major enterprise in the United States during the years of our lives. Politicians recognize quite generally the value of that enterprise and the fact that national security has become increasingly dependent upon its success. The strength of our military defense is measured by the achievements of science more than by any other factor. This is not just a matter of atomic bombs, whether of the fission or the fusion type. Of the three billion dollars spent on science in America during the years 1941–45, exclusive of the money devoted to the development of the atomic bomb, 86 per cent was paid by the U. S. government. Five sixths of the federal expenditure was made through the Department of Defense.

Governmental agencies also depend upon science for the improvement of the public welfare, as well as for the strengthening of military defense. The federal budget for scientific research that contributes to public health, better living conditions, more efficient and widespread use of natural resources, improved educational techniques, and all such factors that make for "better living" is now well over half a billion dollars per year. It is quite unnecessary to labor the point. Politicians need scientists in their business, and will need them more rather than less, as the years come and go.

But this is a two-way street. Scientists are increasingly dependent upon politicians. Approximately 35,000 specialists in the physical, biological, agricultural, and engineering sciences are now employed in government laboratories and research facilities, working under the supervision of politicians. Much of their work is in the development and application of science rather than in fundamental research, but this is "science" nonetheless. Furthermore, thousands of scientists employed in colleges, universities, and industries are actually supported by federal funds, made available for that purpose by vote of the Congress. More than a hundred million dollars is channeled each year through educational institutions, and thrice that amount through industrial laboratories, for research and development under governmental supervision.

It was the scientists of the country who appealed to a reluctant Congress for legislation establishing the National Science Foundation. They had pointed out the many important functions that such an agency, supported by federal funds and administered by civilians, could best perform. The needs were obvious, the procedures clearly defined, and yet the response has not been nearly as generous as the nation's welfare demands. Beyond doubt the scientists will be requesting increased support from the politicians in the coming years.

Surely, all will agree that, if the interdependence of science and politics is not as clearly comprehended as it ought to be, something should be done to make their common ground more obvious. The time is certainly at hand for a moratorium on mutual recrimination, suspicion, and jealousy between scientists and

[1] Based on the address of the Retiring President, delivered at the Annual Meeting of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, December 28, St. Louis, Mo.

politicians, and for a rebirth of a spirit of fair play, constructive cooperation, and mutual understanding. To that end, it is well to consider first the objectives that they hold in common.

Science has a dual objective, and therefore scientists have two functions. On the one hand, science is the quest for knowledge of a certain kind—the kind that leads to the formulation of general laws connecting a number of particular facts. Therefore, the scientist may seek knowledge solely for its own sake and for the satisfaction of his inner urge toward broader, deeper understanding of the nature of the world and of man. Such has been the motivation of many of the greatest scientists of all times. No consideration need be given to the consequences of the results of his search, insofar as they may be useful for any purpose whatever in the practical affairs of everyday life. The only requirement is that each newly acquired bit of information and each new conceptual scheme be fruitful for additional steps that he may take in his quest for knowledge and for truth.

On the other hand, science is power of a certain kind—the kind that makes it possible for men to manipulate nature. The scientist may thus seek scientific knowledge in order that it may be applied to increase the efficiency and the comfort of mankind. This may involve just as fundamental research as any other, or it may be merely the development of techniques and gadgets whereby new concepts are translated into practical operations. It is significant that when scientists today are philosophizing, they are more likely to distinguish between "fundamental research" and "technological development" than between "pure science" and "applied science." The fact is, of course, that every item of scientific knowledge ever gained, in response to whatever motive, has been found sooner or later to have practical significance, either directly or indirectly, in human affairs. Rash indeed would be the scientist who dogmatically asserted that knowledge about nuclear fusion could never contribute to human welfare, impossible though it may now seem to be to imagine that the hydrogen bomb could ever be anything but a horrendous weapon for cataclysmic destruction. Even that, of course, has its far-reaching significance to modern man.

Politics likewise has a dual objective. On the one hand, politics is the administration of the state and the management of public affairs, directed toward the maintenance of order within the nation and its protection against foreign foes. Therefore, politicians enact laws to govern the activities of citizens, limiting their behavior to orderly procedures, and to provide police power to restrain lawbreakers and protect the state. Army, Navy, and Air Force, in the political structure of the United States are, appropriately, administered in the Department of Defense. Concentrating on this objective of politics, the politician seeks power *over* people. Orders are issued; obedience is demanded; disobedience is punished. On occasion, the military power of the state is used for aggressive warfare, the better to protect the state from its external enemies, or for the purpose of bringing more people and more resources under its control.

On the other hand, politics is the administration of the state and the management of public affairs, directed toward the betterment of human welfare and the enrichment of the lives of individuals of whatever status. This far transcends the other objective, with its concentration on order and stability. In recent years, every state, the world around, has become increasingly a social service state. Politicians have found it politic to seek and gain power *with* people, rather than merely to seize and hold power *over* people.

There is also another bifurcation within the political sphere. Whether or not the greater emphasis is placed on one or the other of the two objectives of politics, the goals may be sought in either of two ways. One way involves government of all the people, for some of the people, by a very few of the people. That leads to regimentation within dictatorships and establishes an autocracy. The other way leads to government of all the people, for all the people, by all the people. That involves the universal acceptance of the responsibilities of self-government and establishes a democracy. To those who are prone to quibble about the fact that the United States is officially a republic rather than a democracy, I would suggest that our republic has the structure of a representative democracy, one of several possible alternatives for the democratic pattern of government.

Autocratic politicians, attempting to concentrate power in their own hands, are very likely to look upon science as a most important servant of the state. This, of course, is the attitude in the Soviet Union at the present time. The physical and biological sciences are employed to yield technological improvements, raise living standards, and strengthen police power. The social sciences are especially useful in maintaining control in the hands of the rulers. The techniques whereby minds are manipulated through propaganda have been described and in some instances developed by social psychologists. These techniques have been quickly learned and effectively used by politicians to maintain the supremacy of the state and to achieve their own ambitions for personal power.

To an even greater extent, the politicians in a democracy are necessarily concerned with the progressive development of the sciences and their application to all aspects of life. Such politicians are at least in theory the servants of the people. The citizens who have chosen them as their representatives demand that in all considerations of administrative policy high priority be given to their own economic, social, and cultural welfare. They are likely to insist that the benefits accruing from scientific and technologic achievements be shared as widely and as equably as possible. Both politics and science are expected to operate in the service of mankind. On that common ground the politicians and the scientists should work together in wholehearted cooperation.

Unfortunately, however, such cooperation is not now being displayed in the United States to anything like the extent that is obviously desirable. Competent scientists are reluctant to accept employment with the federal government, and many of those now in the civil service would be glad to leave it for other jobs. A survey of the attitudes of scientists toward various types of employment, made by the President's Scientific Research Board and published in 1947, indicated that of all the scientists questioned "only 11% preferred a Government career. Thirty-one percent preferred industry and 48% the university environment. The remaining 10% preferred consulting work or some other activity." That low estimate of government service as a career is evidently not significantly a matter of financial rewards. The salary scales in industrial laboratories are far higher than those in government bureaus, but the latter are at least as remunerative as those in educational institutions.

That survey was made prior to October 1947. Since then, the search for disloyalty among government employees and the procedures followed by security boards have had their deleterious effects upon government employment. It is almost certain that a similar survey made today would reveal an even lower appraisal of the opportunity afforded by the government for a successful career in science, in comparison to that available in other ways.

Friction between scientists and politicians extends, even more unfortunately, far beyond the area in which the politicians hold the purse strings and therefore can enact the detailed regulations which the scientists must obey. The *Internal Security Act* of 1950, popularly known as the McCarran Act, and the *McCarran-Walter Immigration Act* of 1952 have dropped a "red tape curtain" around the United States, which in many evil ways resembles the Iron Curtain around the Soviet Union. Each of those measures was passed by the Congress over the veto of President Truman. In his veto messages, the president spelled out the harmful consequences of the legislation to the nation, and displayed a far clearer comprehension of the bad effect it would have upon science in America than was displayed by those who voted to enact it. The dire impact of that legislation upon science in America is so well known that I do not need to tell the story here.

This whole question of the conflict between intellectual freedom, essential to the uninterrupted progress of science, and national security, essential to the preservation of our country in this period of real danger, ought to have much more careful study than it has yet received. It is so confused by prejudice, suspicion, and fear that it is almost impossible to remove it from the fires of emotion and weigh it on the balance of reason. But unless this is done the welfare of our country will be seriously jeopardized.

Most of the freedoms that we hold so dear are relative freedoms, to be exercised only within more or less clearly defined limits. Some of them have to be abandoned or more sharply restricted in time of war, either hot or cold. The most basic freedom of all is intellectual freedom, the right of a man to think his own thoughts and announce them without fear to those who will listen to him. This is the freedom that is safeguarded by our Constitution's Bill of Rights, although there it is spelled out in terms of freedom of speech, of the press, of peaceful assembly, and of the free exercise of religion. It is, in fact, the very touchstone of democracy, the creator and preserver of the orderly flexibility that makes democracy so much more efficient and desirable than any autocracy. The real test of democracy is not applied by asking questions about the statements embodied in a nation's constitution or the presence or absence of ballot boxes and universal suffrage. If anyone wants to know whether the community, state, or nation in which he resides is truly democratic, let him ask this question: What actually happens to the member of an unpopular minority when he dares to speak his mind in opposition to the spokesmen of the popular majority?

When that test is applied to the organizations and communities of scientists in the United States, they are found to fall within the democratic bands of the broad spectrum that ranges from stark autocracy at one end to perfect democracy at the other. In fact, many of the significant new ideas that have led to progress in each sector along the expanding frontier of science have been first proposed by an individual, or a small minority, in opposition to views widely held by large majorities. The novel concepts have been appraised in the market place of public opinion. Each scientist has been encouraged to form and express his own independent judgment. No hierarchy of academicians has decreed what is orthodox, or branded as subversive anyone who deviated from the approved "line." Even though one scientist may strongly disagree with another's opinions, he knows he must defend the other's right to express them, else he will be false to his calling as a seeker for more accurate understanding of the ways of nature. If the suspicion should enter his mind that perhaps in times of ideological conflict a little thought control might be desirable, he has only to remind himself of the sorry plight of the biological sciences in the Soviet Union.

Intellectual freedom for scientists inevitably conflicts with the necessity for national security. To what extent and in what ways should it be limited? The answer to that question has thus far been given by the politicians, with woefully inadequate consideration of the scientist's point of view. Political screening is necessary in certain sensitive areas where scientists deal with military secrets. Unfortunately, those areas have been either too loosely or too broadly defined. They should be restricted to the absolute minimum. The ideas of competent scientists concerning what that minimum should be ought to have far more respectful consideration than they have thus far received.

The nature of the political tests also needs reexamination. The fundamental difficulty here arises from a basic disparity between the mental processes

of scientists and politicians. In debates across a frontier, the primary aim of the true scientist is to understand rather than to refute. In such debates, most politicians aim to demonstrate their own worth and insist upon the correctness of their own views, rather than attempt to understand an opponent's ideas. Altogether too few politicians in America display the intellectual qualities of political scientists.

Consequently, the scientist who tries to understand the motives and the behavior of people on the other side of the current ideological conflict is engaging in an intellectual enterprise quite foreign to the politician's mental and emotional habits. He is therefore open to suspicion and will almost certainly be caught by the political screen of "reasonable doubt." There is of course some truth in the well-known saying that a man is known by the company he keeps. But that method of appraisal is valid only when it is taken to mean: a man is known by all the company he keeps. To base conclusions solely upon a man's associations with a few organizations or individuals, especially selected by angry politicians, is both unscientific and unjust. Either all his associations, or none, should be considered by those responsible for political screening to ensure national security.

It would be bad enough if the harmful policies and practices were applied only to the scientists working on projects that have security implications. Actually they are extended far beyond that relatively small group. Political orthodoxy, rather than mere technical competence, has been accepted as a basic qualification in many academic institutions and industrial laboratories, even when the work is completely unclassified and does not involve access to anything that could be considered a military secret. Administrators dare not risk charges that might be made by Congressional committees, or by radio and newspaper commentators, that they are employing "red" scientists. Many institutions have their own security officers, who are concerned not only with the personnel employed in classified projects, but also with those engaged in scientific research not covered by security regulations. Particularly where academic tenure is not a stumbling block, it has been comparatively easy to dismiss, or to bar from employment, capable scientists accused of past association with organizations now considered questionable or subversive. The number of such tragedies is far greater than any statistician can ever discover. Both the unfortunate victims and the institutions by which they have been employed have characteristically shunned publicity, for reasons that may differ from case to case but add up to a definitely hush-hush policy.

Intellectual freedom involves the free interchange of information and ideas among scientists not only within our country but also between and among those of all nationalities. Among the most stimulating factors in scientific progress are the international gatherings of specialists in the various scientific disciplines and the visits of foreign scientists to the centers of research and development in the United States. Few persons, other than the scientists themselves, are aware of the tremendous indebtedness of American technology to scientific research prosecuted in other countries. Freedom to travel may not be one of the justly celebrated "Four Freedoms," but for the man of science it ranks at least as high as any other.

Especially since the passage of the *McCarran Act* in 1950, the Department of State has been exercising increasingly rigid control over the movements of American and foreign scientists, both in and out of our country. The power to withhold passports and visas is one which, when improperly used, can deal a telling blow to scientific progress. International gatherings of scientists have been curtailed, both in America and abroad, by the establishment of political and ideological tests of fitness to enter or leave the United States. Individuals of unquestionably high scientific competence have been denied passports for travel abroad, in some instances to pursue research projects of vital importance to our country. Foreign scientists of equally fine standing in their professions have been barred from entrance, even when invited for specific services to be rendered at some of our most important universities or laboratories. In each instance the refusal is explained on the grounds that the issuance of the requested passport or visa is not in "the best interests of the United States."

The repercussion of such events throughout the great body of American scientists cannot but be deleterious in the extreme. Not knowing what alleged crimes have brought this penalty upon one of their number, the scientists, upon whom the future security and prosperity of our country depend, find their efficiency decreased in subtle but significant ways. Each will decide that the only way to avoid a similar fate is to withdraw completely from all participation in public affairs. No longer will they dare to give critical consideration to the social implications of their work. In one large compartment of their lives, in which they should accept their responsibilities as citizens in a democracy, they will fit their minds into the Procrustean bed of rigid conformity to official governmental policies and majority opinion. How soon this acceptance of authoritarian dictates will carry over into the other compartment of their lives, in which scientific habits of thought have proved so invigorating for scientific progress, is a neat question for the psychologists. At the moment, it is generally held that schizophrenia is quite bad for man.

Certainly the scientists of America cannot be expected to do their best work as long as they remain in the stultifying atmosphere that has been imposed upon them by political trends. The appeal to get them out into the fresh air, where the winds of freedom and confidence will once more stimulate them to high intellectual adventure, is based not so much upon selfish desire for the personal welfare of individual scientists, as upon the recognition of what is absolutely essential to the continuing health of science as an

important contributor to the future of America.

Scientists and politicians have so much to do when they get together on the common ground of service to mankind, that friendly cooperation, in mutual trust, should certainly be the aim of all. Scientists have solved most of the technical problems of reducing infant mortality and prolonging life through sanitation and medicine. Politicians have provided public hospitals and public health agencies. They are jointly responsible for the unprecedented increase in world population that has characterized the first half of the twentieth century. Scientists must now accept the responsibility of solving the technical problems involved in providing adequate subsistence for growing populations. And politicians must arrange for appropriate sharing both of technical skills and of the means of subsistence in all parts of the world.

These are not impossible tasks. I have no space to develop details—I simply assert that in my opinion the resources of the earth, when made available by the science of today and tomorrow, will prove adequate to meet all the needs of mankind for untold years to come. The present rate of population increase is both unprecedented and temporary. It is far lower in those parts of the world that are now enjoying an economy of plenty than in those parts still laboring within an economy of scarcity. The politicians of India have followed the advice of scientists and have adopted a decreased birth rate as an item of national policy. There is good reason to expect that the world's net reproductive rate will be appreciably lower by the end of the century than it is at present.

The goal for this joint task force of scientists and politicians should be a standard of living everywhere at a level adequate to promote social and political stability in a free and democratic society. That is quite different from attempting to provide an American diet and an American standard of living for all people everywhere. The physical and biological scientists are already well on the way toward solving the technical problems along the route to that goal. Their part of the task is in accord with their well-established habits of mind and their attitudes toward human welfare. For politicians, however, this will be a different story. The management of public affairs is inherently more difficult than the management of soils, seed crops, or livestock. Politicians will need all the help that the social scientists and the educators can give them. Moreover, politicians have for the most part been thinking within the framework of an economy of scarcity, even in lands where the industrial and agricultural revolutions, made possible by science and technology, have brought prosperity to fortunate people. It will be quite a feat of mental and emotional gymnastics for them to reverse the field and formulate policies appropriate to an economy of plenty.

Education will obviously play a major role in this project, and educators also are cultivating this same "common ground." Indeed, there is plenty of room within its broad horizon for artists, men of religion, and many others. In a very real sense, an educator is a sort of hybrid individual, combining many of the characteristics, methods, and aims of the scientist and the politician. Be that as it may, the educators, too, will have to blaze some new trails.

In many insufficiently developed regions, fundamental education, urgently needed by adults as well as children, should have much more emphasis upon science than is currently given. Adherence to long-established policies of teaching classics, literature, and philosophy leads to the slighting or even the omission of science in certain countries. Emphasis upon trades and technical skills, in other programs, fails to inculcate knowledge of the methodology of science.

Even in countries like our own, where the teaching of science is stressed almost or quite to the point of slighting the humanities and the fine arts, there is a challenge to educators far more basic than that of perfecting the techniques of education. The great body of scientific knowledge appears to be a collection of separate fragments. The conceptual schemes developed in the separate areas of investigative analysis seem to bear little or no relation to each other. Specialists in each narrowly prescribed field of research have their own vocabulary and speak a language that can scarcely be comprehended by others. The need for synthesis and integration among the sciences is urgent.

It is not enough for geologists to borrow techniques and apparatus from the physicists in order to engage in geophysical research. Or for biologists to equip themselves with the paraphernalia of the chemist's laboratory and announce that they are biochemists. Synthesis and integration must be sought at a much deeper level. Truly integrative science will seek basic concepts that are valid in all the scientific compartments, conceptual schemes that tie together the disparate knowledge now displayed in academic showcases. Above all, it will make more clearly visible the unity of the universe and the fundamental nature of its orderliness.

This is especially important for men who want to live in a free society. Chaotic aggregations, although susceptible to statistical description, leave the individual unit under the domination of capriciousness. Freedom is a function of order, not of lawlessness. As it reveals the fundamental place of order in the universe, integrative science will validate the intuitive urge of man for freedom.

The politicians of America have a vital interest here. Educational procedures in our academic system have all too often stressed philosophically unrelated technical specialization. Practical competence has been inculcated, without an accompanying emphasis upon culture. There has been premature dependence upon science alone, and ethical values have been sadly neglected. All this has led to confusion, irresolution, demagogism, and the crippling of the democratic body politic. Science without conscience is in danger of leading us all to catastrophe.

Scientists also have a stake in the area of integra-

tive education. Not only must they accept responsibility for research along basic conceptual lines, but they must assist in the development of a climate of public opinion that recognizes the supreme worth of intellectual freedom. They must resist every effort to have education serve a society that maintains the symbols of political democracy, but actually concedes final control to covert concentrations of power that use educational skills to arrogate to themselves the administration of national welfare. Perhaps psychologists and psychiatrists might make their most valuable contributions in the next few years if they would concentrate their research, not on how to influence and manipulate people, but on how to free people from the compulsion to control others.

Less than one half of 1 per cent of the inhabitants of the United States are professionally engaged in scientific research, the technological application of its results, and the teaching of science. These scientists share the responsibility for human welfare with all other citizens. They cannot, however, escape the fact that because of their intellectual powers and their influence in forming public opinion, theirs is a larger share of that responsibility than their numbers alone would indicate.

Only those scientists who have both a social conscience and a large measure of courage will take the calculated risk of cultivating the common ground of science and politics. Knowing my colleagues as I do, I am confident that there are enough of them to make a powerful and beneficent impact upon public affairs in this country of ours, which even now has some claim to be "the land of the free and the home of the brave."

Warren Weaver, AAAS President-Elect

Chester I. Barnard

Chairman, National Science Foundation

WARREN WEAVER, the new President-Elect of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, is director of The Rockefeller Foundation's Division of Natural Sciences and Agriculture. Elected at the Association's 119th meeting at St. Louis last December, Dr. Weaver will take office in 1954.

Dr. Weaver, who began his career with a strong interest in engineering and mathematical physics, was born in Reedsburg, Wisconsin, on July 17, 1894. From the University of Wisconsin he received a B.S. degree in 1916 and the degree of civil engineer in the following year. His early teaching experience at Throop College and the California Institute of Technology was interrupted by service as a second lieutenant in the U. S. Army Air Service from 1917 to 1919. In 1920 Dr. Weaver returned to his alma mater as assistant professor of mathematics completing his doctoral dissertation on electromagnetic theory and receiving the Ph.D. in 1921. Four years later he was promoted to the rank of associate professor, and in 1928 he became a full professor and chairman of the Department of Mathematics. During this period Dr. Weaver's published research, as well as his graduate teaching, was largely concerned with electrodynamics and diffusion theory. To Charles S. Slichter and Max Mason, with whom he was closely associated at this time, Dr. Weaver gives credit for directing him into his chosen specialty. With Professor Mason he collaborated in writing *The Electromagnetic Field*, in 1929. Four years earlier he was co-author with Charles S. Slichter of *Elementary Mathematical Analysis*.

In 1932 Dr. Weaver was invited to succeed Herman A. Spoehr as director of the Natural Sciences Division at The Rockefeller Foundation in New York. Dr. Weaver also served (1932–37) as director for the Division of Natural Sciences of the General Education Board, another Rockefeller board which at that time became interested in strengthening science teaching in our Southern universities. In these capacities he has had unusually broad experience and contacts in science.

Called upon to return to his original interests in applied mathematics during World War II, Dr. Weaver directed government research projects in the Office of Scientific Research and Development. From July 1940 until December 1942 he served as chairman of Section D-2, the Fire Control Division, of the National Defense Research Committee, and from 1943 to 1946 as chief of the Applied Mathematics Panel, an organization of over 200 mathematicians and statisticians working on a wide variety of military problems.

As early as 1941 Dr. Weaver had served on an official scientific mission, under James Bryant Conant, to investigate British weapons development. For his outstanding services in connection with the development of antiaircraft fire-control devices (prediction computers and controlling servomechanisms) and of bombsights and computing sights for use in air-to-air combat Dr. Weaver in 1948 received the Medal for Merit, the highest award made to civilians in the United States. He was also decorated with the King's Medal for Service in the Cause of Freedom by the

British government, and in 1951 he received the decoration of Officier of the Légion d'Honneur of France. Since the end of World War II Dr. Weaver has served as chairman of the Naval Research Advisory Committee and as a member of the Research Advisory Panel of the War Department.

In 1919 Dr. Weaver married Mary Hemenway. The Weavers have two children, Helen Hemenway and Warren, Jr., who is on the editorial staff of the New York *Times*.

One of Dr. Weaver's intense personal interests is in communication and mathematical probability theory. In some recent articles on this subject, he stresses the view that all scientists are deeply concerned with probability.

Science deals (as in mathematics) with statements about theory which are logically accurate, but to which the concept of "truth" does not apply; it also deals (as in physics) with statements about nature which can never in a rigorous sense be known to be true, but can at best only be known to be highly probable. It is rather surprisingly the case that the only time man is ever really sure is not when he is dealing with science, but when he is dealing with matters of faith. . . . For in a vast range of cases in which it is entirely impossible for science to answer the question "Is this statement true?" probability theory does furnish the basis for judgment as to how likely it is that the statement is true. It is probability which, in an important fraction of cases, enables man to resolve the paradoxical dilemma pointed out by Samuel Butler: "Life is the art of drawing sufficient conclusions from insufficient premises" (*Sci. Amer.*, **183**, 47 [Oct. 1950]).

In 1949 Dr. Weaver collaborated with Claude E. Shannon, of Bell Telephone Laboratories, in a book entitled *The Mathematical Theory of Communication*. The theory developed in these pages holds that communication—whether by speech, music, pictures, signs, gestures, or any other of the variety of means that men use to convey ideas—is based on the statistical nature of language. Dr. Weaver regards the Shannon theory so broadly and imaginatively motivated that it applies to all forms of communication. It is basic to the science of coding, contributes to the problem of translation from one language to another, and connects closely with the design of mechanical computers, differential analyzers, and other so-called thinking machines.

In his hobbies, Dr. Weaver carries over his interest in statistical thinking. He is a collector of the writings of Lewis Carroll and is the author of several highly entertaining articles on *Alice's Adventures in Wonderland* and its creator.

In line with his deep interest in the communication problems of science, Dr. Weaver possesses an unusual talent for interpreting one branch of science to other scientists. He also has the ability to reduce abstruse mathematical theory into terms that can be understood, or at least appreciated, by the layman, and to relate this theory to phenomena of everyday life. He is frequently called upon to lecture before groups outside his own fields of interest or to write for publications that have a general audience. He has recently contributed a chapter, "Probability and Statistics," to the volume *Facing the Future's Risks*, edited by Lyman Bryson and published this year. A few years ago he served as chairman of the advisory committee of the Intermission Science Series of the New York Philharmonic-Symphony Broadcasts. These Sunday afternoon programs brought more than eighty American scientists to the microphone to present various aspects of modern science to the lay public. The speeches were published in a volume entitled *The Scientists Speak*, edited by Dr. Weaver.

Further evidence of Dr. Weaver's breadth of interest is his constant concern about community affairs. In 1951 he spoke before the New York Herald Tribune Forum on local problems of freedom and how these are solved in his own community of Scarsdale, New York.

In his position as director of the Division of Natural Sciences and Agriculture, Dr. Weaver has had contact with most of the physical and biological sciences. Geographically, his work has involved extensive travel in Western Europe, Mexico, Central America, South America, and the United States. He has long-standing personal acquaintance with scientists of all countries.

Although his own interests lie in the mathematical

and physical sciences, he has looked upon his major task at The Rockefeller Foundation as that of obtaining greater support for the development of experimental biology, including such fields as genetics, cellular physiology, biochemistry, and experimental embryology. The physical sciences, in dealing with inanimate nature, which can be broken up into bits and analyzed without losing its essential character, have stolen a march on the biological sciences; but wisdom to utilize properly this increased knowledge of physical nature is not yet available. If man is to avoid becoming degraded by gadgetry or destroyed by physical force, Dr. Weaver is convinced that certain basic problems involved in understanding individual human behavior must be solved. And before so complex a subject as the behavior of man can become clear, scientists obviously must gain a tremendous amount of information and insight regarding living organisms in general, starting necessarily with simpler forms of life. At the same time, it is clear that the physical sciences have, in technique and in experimental procedures, a great deal to contribute to the study of biological problems.

A large part of Dr. Weaver's administrative effort has thus been devoted to the promotion of cross-disciplinary studies; for example, in mathematical biology, in biochemical genetics, in biophysics. His stress is on basic, central problems that demand concerted attack from many sides: "The coming of age of biology will be seriously impeded unless the circumstances of encouragement and support are favorable for the breaking down of old orthodox compartments in science, unless all the tools and techniques of the physicist, the chemist, and the mathematician can be brought effectively to bear."

In 1943 agriculture was added to the foundation's program in the natural sciences. Agriculture, Dr. Weaver explains, is in large part applied biology and hence is a logical part of an expanding program in biology. His division has two kinds of activities in agriculture. It cooperates with foreign governments in agricultural research. Programs are under way in Mexico and Colombia, with the practical aim of using science to improve both the quality and quantity of basic food crops. The other activity places increasing emphasis on agricultural science—the encouragement of advanced research and the training of personnel.

Dr. Weaver became a fellow of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE in 1928 and has served as a member of the Executive Committee since 1950. From 1936 to 1939 and from 1944 to 1947, Dr. Weaver was a member of the National Research Council's Division of Physical Sciences, and in 1951 he was asked to serve on the council's committee on high-speed computing machines. In 1951, also, he was appointed to the board of scientific consultants of the Sloan-Kettering Institute for Cancer Research.

The foregoing biographical notes, which resemble an expanded *Who's Who* account, were prepared for me "from the record" by The Rockefeller Foundation publication office, and some of them were, in fact, news to me. But this man and his career deserve a more personal appraisal. I have worked with Warren Weaver for nearly thirteen years, intermittently from 1940 to 1948 as a trustee of The Rockefeller Foundation and always as a member of its Executive Committee; and from 1948 to 1952 as an officer of the foundation, in almost daily contact with him and spiritually in persistent association with him. Space is not available here to write all I would like to, and all that would be worth reading; but I must say at least the following:

First: The extraordinary versatility of Weaver's scientific interests and experience implies intellectual flexibility, but might suggest a lowering of standards of precision and rigor, for in some fields only first and very rough approximations are available. It is my view that, in his case, there has been no deterioration of intellectual and scientific standards. Knowing the variety of efforts required of him, this is really a noteworthy achievement.

Second: His natural talent, as a teacher, in communicating science to laymen is outstanding. No one having that talent could appear month after month before the Rockefeller board and committees to defend recommendations without developing it effectively, but the impulse starting all this comes from the belief that an important function of scientists is to make the significance and aesthetic experience of science available to the literate public. Scientists have neglected or disregarded this function, but its importance is increasingly evident.

Finally, I must say that I regard Warren Weaver primarily as a humanist. This is not because of his interest in Lewis Carroll's writings or in any other subject ordinarily regarded as humanistic. It is because these interests are combined with an essentially similar approach to science, which he considers good in itself. Science is a value to be cultivated for its own sake, not necessarily or chiefly for utilitarian purposes. The curiosity, the initiative, the imagination, the persistence, the patience, the frustrations, that must be experienced and endured in science cannot be adequately motivated by the current exaggeration of the usefulness of science, but must be founded on the belief that all this toil is justified as an expression of the superior faculties of mankind and as a contribution to the values of man as a whole. So I hail Warren Weaver as superbly exemplifying this philosophy.

News and Notes

Pleistocene Field Conference in Rocky Mountain National Park

THE Rocky Mountain Section of the Friends of the Pleistocene, organized at a sectional meeting of the Geological Society of America in Salt Lake City in May 1952, held its first annual field conference in Rocky Mountain National Park Oct. 4–5. Thirty-eight geologists, geographers, and ecologists from four states attended. The conference, under the leadership of Gerald M. Richmond, U. S. Geological Survey, studied alpine periglacial phenomena along Trail Ridge Road and reviewed the glacial stratigraphy of the park.

On the first day the group examined solifluction sheets, terraces, and lobes at and above timberline, noting variations in the surface form, texture, and structure of these deposits. Seasonally active deposits are clearly related to the position of summer snowbanks at their heads. Increasing stability in relatively recent time is suggested by the abundance of deposits that are fresh in appearance and have no soil profile, but lack evidence of movement even at times of thaw. A few are being eroded by springs sapping at their fronts.

Frost structures are abundant, especially on the solifluction lobes and terraces. Sorted polygons and unsorted circles occur on the crests and gentle back-slopes of these deposits; sorted stripes have formed on some where the slope is more than 7°. Most seasonally active frost structures lie at the toes of summer snowbanks. Their position on the solifluction terraces ranges from near the crests to well up on the back-slopes, depending on the size of the snowbanks. Where polygons have become inactive, tundra vegetation has encroached from their margins toward the centers, enclosing small seasonal ponds that have a peculiar rectangular shape. Water is retained at different levels in adjacent ponds. Various hypotheses for the origin of the frost structures and related features were the subject of enthusiastic speculation.

Block rubble deposits ranging from small individual block streams through an intricate net of branching streams to broad block fields were examined. They are formed in a pre-existing, unconsolidated mantle of coarse and fine material on slopes ranging from very steep to very gentle. The block rubble deposits truncate a relatively mature soil developed on the unconsolidated mantle. The following hypotheses for their origin at this locality was outlined by Richmond: The permeable mantle retains little summer rain or meltwater, and precipitation in the fall is slight. The mantle is thus relatively dry at the time of permanent winter freezing. Early snows, however, yield meltwater that infiltrates, freezes, and is therefore retained at shallow depths. Frost heave accompanies freezing and locally disrupts the tundra vegetation, exposing it to surface desiccation. During most of the winter the ground remains frozen, with a patchy snow cover and many wind-swept areas. Spring and summer thaws are gradual, and at any given time they probably affect only a relatively thin layer of the mantle. Meltwater derived from thawing ground tends to wash the fine material out of the mantle along irregular channels or broad areas, leaving a coarse block rubble concentrate. Solifluction of the thaw layer at the base of the rubble takes place in conjunction with the washing, depending on the thickness of the layer and its degree of saturation. Such movement, however, is considered to have been slight. Its chief effects are settling and some degree of sorting of the blocks, orientation of slabby fragments parallel to the borders or imbricate to the front, and construction of a low rampart at the tonguelike or lobate front of the deposits.

On the second day, the succession of glacial moraines along Fall River and in Moraine Park along Thompson River were examined. Remnants of lateral moraines at altitudes between 7950 and 8200 ft in the valley of Fall River are thought to be of early Wisconsin (Iowan and Tazewell) age. They have a well-developed soil profile, which is believed to be equivalent to the "Brady" soil of mid-Wisconsin age because of its relative stage of development and stratigraphic position. This soil was observed in a brown-podzolic facies on outwash or till above about 7700 ft and in a brown soil facies on outwash and slope deposits below that altitude. The large moraines between 8200 and 8400 ft along Fall River above the park border are considered to be of Cary age. A low gravelly moraine at about 8550 ft near the turnoff of the road to Fall River Pass is probably of Mankato age. These late Wisconsin (Cary and Mankato) moraines have a moderately to weakly developed soil profile. Morainal debris between 8900 and 9300 ft in the canyon upstream is probably ground moraine of Mankato age. A small end moraine at 10,700 ft just below the ranger station on the road up Fall River Pass may represent a recessional halt from the Mankato, a minor readvance of the Mankato, or a post-Mankato, prealtithermal (prior to climatic optimum) readvance. It has a soil profile similar to that of the late Wisconsin moraines downstream. Another small end moraine at 11,400 ft in the cirque at Fall River Pass supports vegetation but has only a weakly developed azonal soil. It is overlapped by active talus and is believed to represent a postaltithermal Recent readvance of the ice. A similar and probably correlative moraine lies at about 10,000 ft in Spruce Canyon nearly 1½ miles below Sprague Glacier at the headwaters of the Thompson River. The maximum extent of the late Recent readvance is represented by fresh moraines in front of existing glaciers or in recently evacuated cirques. Typical is that just below Sprague

Glacier at 11,800 ft. This advance does not appear to have developed in the cirque at Fall River Pass.

Pre-Wisconsin till, not yet found in the valleys of Fall River and Thompson River, has been discovered by W. S. Cooper (*1*) in Tahosa Valley east of Longs Peak. The relatively thin, discontinuous deposits lacking morainal expression and having a thick, reddish, clayey soil were examined by the group.

Table 1, comparing Richmond's interpretation of

TABLE 1

WISCONSIN AND RECENT GLACIAL CHRONOLOGY OF ROCKY MOUNTAIN NATIONAL PARK

Jones and Quam, 1944	Richmond, 1952	Ray, 1940
	Late recent moraine	Wisconsin V
	Very weak azonal soil	
Upper valley moraines	Postaltithermal recent moraine	?Wisconsin IV—Cochrane (?)
	Moderate to weak soil	?Wisconsin III—late Mankato
	Prealtithermal moraine	
	Mankato moraine	
Faint soil profile		
Park border moraines	Cary moraines	Wisconsin II—Tazewell-Cary
Mature soil profile	Strong soil ("Brady" soil)	
Old moraine remnants	Tazewell and Iowan moraine remnants	Wisconsin I—Iowan

the Wisconsin and Recent glacial chronology with that of Ray (*2*) and that of Jones and Quam (*3*) was discussed.

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1. COOPER, W. S. Personal communication.
2. RAY, L. L. *Bull. Geol. Soc. Am.*, **51**, 1868 (1940).
3. JONES, W. W., and QUAM, L. O. *J. Geol.*, **52**, 218 (1944).

GERALD M. RICHMOND

U. S. Geological Survey
Geological Division, Denver Federal Center

Scientists in the News

Harold H. Abelson, member of the faculty of City College, New York, since 1924, has been appointed dean of its School of Education. Dr. Abelson is the author of several books on educational research and child guidance.

Kenneth Bailey, of the University of Cambridge, England, and **Esmond E. Snell,** of the University of Texas, have been appointed Walker-Ames professors in biochemistry at the University of Washington, Seattle. Dr. Bailey will lecture during the first half of the spring quarter, on the biochemistry of muscle; Dr. Snell's lectures, during the second half of the quarter, will deal with microbial biochemistry.

Joseph W. Barker, president of the Research Corporation, has been elected chairman of the Scientific Research Society of America, New Haven, to succeed **Karl T. Compton,** whose second term ends in June 1953.

Three cash awards were made to scientists by the Glycerine Producers' Association for outstanding contributions to knowledge and uses of glycerine during 1952. The first award was shared by **Ivan W. Brown, Jr.,** of Duke University, and **B. J. Luyet** of St. Louis University, for discoveries related to the survival of cell life under freezing conditions. The second went to **Raymond Reiser** and **Hermann Schlenk,** both of the Texas Agricultural Experiment Station, for establishing the importance of monoglycerides in nutrition. The third award was given to a research team at the Southern Regional Laboratory headed by **Reuben O. Feuge,** for work on the development of special modified fats which form edible plastic films for food products.

Cledo Brunetti has resigned as associate director of Stanford Research Institute to accept an executive research post with General Mills Mechanical Division at Minneapolis.

M. G. Candau, assistant director of the Pan American Sanitary Bureau, World Health Organization, has been nominated director-general of WHO. The nomination is subject to confirmation by the Sixth World Health Assembly, which meets in Geneva May 5. Dr. Candau will replace **Brock Chisholm,** whose five-year term expires in July.

James W. Colbert, Jr., has been appointed dean of the St. Louis University School of Medicine, effective in March. Dr. Colbert has been assistant dean in charge of postgraduate studies at the Yale School of Medicine, and, at 32, will be the youngest dean of any major medical school in the country.

Frederick Cordes, professor of ophthalmology at the University of California Medical Center, San Francisco, will give the annual John O. McReynolds Lecture at the University of Texas Medical Branch, Galveston, on Mar. 31. He will speak on "The Evaluation of the Vision in the Diabetic."

Scott P. Ewing, of the Carter Oil Company, Tulsa, has been selected to receive the Frank Newman Speller Award of the National Association of Corrosion Engineers, for his work in solving underground and marine corrosion problems. **Robert M. Burns,** of Bell Telephone Laboratories, will receive the association's Willis Rodney Whitney Award for 1953, for achievement in corrosion science.

Kenneth R. Fox, formerly of Burlington Mills Corporation, has joined the Fabric Research Laboratories, Inc., Boston, as vice president and member of the Board of Directors. Mr. Fox will head a newly created development group to adapt findings of laboratory product and process research to serve the textile and allied industries.

John V. N. Granger, of Stanford Research Institute, has been chosen by Eta Kappa Nu, national honor society of electrical engineers, as "Outstanding Young Electrical Engineer of 1952." The award is based upon service to the community as well as professional achievement.

L. H. Hance has been elected executive vice president of the Institute of Textile Technology, Charlottesville, Va., and president-elect to succeed **J. L. Vaughn,** who will resume his duties at the University of Virginia Sept. 1.

A. Bradford Hill, professor of medical statistics at the London School of Hygiene and Tropical Medicine, and honorary director of the Statistical Research Unit of the Medical Research Council, will deliver the Cutter Lecture on Preventive Medicine, speaking on "Observation and Experiment," at the Harvard School of Public Health on Mar. 25.

S. L. Hora, director, Zoological Survey of India, has undertaken the preparation of a handbook of fish cultural practices in the tropical and subtropical countries of the world, at the invitation of the UN Food and Agriculture Organization. The handbook is expected to be ready by the end of 1954.

Charles Huggins, of the Ben May Cancer Laboratory, University of Chicago, will give the annual Meyer Bodansky Lecture at the University of Texas Medical Branch on Mar. 6. His title will be "The Adrenal and Cancer."

Henry H. Kessler, founder and medical director of the Kessler Institute for Rehabilitation, West Orange, N. J., has received a Presidential Award, signed by Harry S. Truman, for outstanding service to the physically handicapped.

C. H. Kollenberg has been promoted to assistant division head of the technical service division at the Baytown (Texas) refinery, Humble Oil & Refining Company. Dr. Kollenberg has been with Humble since 1940, and has been a section head for the past eight years.

Arthur Kornberg, chief of the enzyme and metabolism section of the National Institutes of Health, has been appointed professor of microbiology and head of that department at Washington University, St. Louis.

Frederic Henry Lahee, Sun Oil Company, Dallas, has been named recipient of the Sidney Powers Memorial Medal of the American Association of Petroleum Geologists for achievement in the field of petroleum geology and for pioneering in the gathering and use of hydrocarbon reserve and exploration data.

M. M. Leighton, chief, Illinois State Geological Survey, gave the annual Bownocker Lectures at the invitation of the Department of Geology, Ohio State University. His subjects were "The Loess Deposits of the Mississippi Valley," "The Basis for the Glacial Substages of the Wisconsin Stage in Illinois and Adjacent States," and a public lecture, sponsored jointly by the department and the local chapter of Sigma XI, on "Our Natural Resources: Their Continuing Discovery and Human Progress."

George F. McAneny has been appointed commandant of the Quartermaster Food and Container Institute for the Armed Forces, Chicago. He relieves **Charles A. Shaunesey,** commandant since August 1951, who has received an assignment with the Far East Command.

Raymond G. McCarthy, executive director of the Yale Plan Clinic since 1944, and author of several books on alcoholism, has been appointed director of alcoholism research for the New York State Mental Health Commission.

Ralph W. McKee, of the Department of Biological Chemistry, Harvard Medical School, has joined the Department of Physiological Chemistry, University of California Medical Center, Los Angeles.

C. E. Kenneth Mees, of Eastman Kodak Company, has been awarded the 1952 Progress Medal of Great Britain's Royal Photographic Society. Mr. Mees also received the award in 1913 for research contributions to the scientific development of photography.

Max J. Miller, associate professor in the Institute of Parasitology of Macdonald College, McGill University, has been named research director of the Liberian Institute of the American Foundation for Tropical Medicine, Harbel, West Africa. The institute was established in 1946 for the stimulation of research in the causes, treatment, and control of tropical diseases.

Lee A. Somers, extension vegetable crops specialist, Horticulture Department, University of Illinois, will retire from the extension service on Feb. 28. Mr. Somers has been active in radio extension teaching.

Hale Sutherland, professor of civil engineering, has retired after 23 years as a member of the faculty of Lehigh University. He has helped to establish humanistic social courses in the engineering program throughout the universities of the nation.

Jacob Traum, professor of veterinary science at the University of California's School of Veterinary Medicine since 1914, has been named a chief scientist for the USDA Plum Island Animal Disease Research Institute. Dr. Traum will be responsible for virological and bacteriological studies at the institute.

Calvin H. Yuill, authority in building materials research, has been named director of the Fire Technology Division, Southwest Research Institute. Dr. Yuill, previously assistant director of the division, replaces **Norman C. Penfold,** who was recently named associate director.

Education

Austrian universities are offering an extensive list of school and seminar programs for the summer of 1953. The European Forum at Alpbach, near Innsbruck, will include seminars, courses, lectures, discussion groups, and panel discussions in German, English, and French, with the over-all theme of "What Is Man?" Courses in economics will be given during August at Bad Ischl, Upper Austria. Other lectures and courses will be given in Graz, Vienna, Salzburg, and at several Alpine lake resorts and country villages. Full information may be obtained from the Austrian Information Department, 31 E. 69th St., New York 21.

The **Biological Laboratory,** Cold Spring Harbor, N. Y., is offering the following specialized summer courses: Bacterial Viruses, June 22–July 11, with Mark H. Adams, of New York University, in charge; Cytology of Microorganisms, June 22–July 11, under E. D. DeLamater, of the University of Pennsylvania; Bacterial Genetics, July 15–Aug. 4, with E. M. Witkin, V. Bryson, M. Demerec, and staff. Full information may be obtained from the laboratory.

The **University of Kansas** expects to complete its $2,650,000 Science Hall in the spring of 1954, with first classes to be held in it the following fall. The departments of chemistry and physics and the School of Pharmacy will be housed in the new building.

New appointments at the **University of Louisville,** School of Medicine, include Joseph P. Holt, professor of heart research, Department of Medicine and director, Institute of Medical Research; Everitt L. Pirkey, chairman, Department of Radiology; Rudolph J. Noer, professor and chairman, Department of Surgery; John F. Taylor, professor and chairman, Department of Biochemistry; John F. Miley, professor of military science and tactics; Robert F. Hansen, associate professor of community health and deputy director of health, Louisville and Jefferson County Health Department; Israel Diamond, associate professor of pediatrics and of pathology; Herbert D. Kerman, associate professor of radiology; and Charles H. Duncan, assistant professor of psychiatry and of medicine.

Massachusetts Institute of Technology will offer the following new summer courses: Strength of Materials, Strain Gage Techniques, Thermodynamics, Product Design, Fluid Power Control, Casting Light Metals, Physical Metallurgy, Transistors and their Applications, Noise Reduction, Management Responsibility for Occupational Health, Operations Research, Control Problems of the Executive, Automatic Control of Aircraft, and Mathematical Problems of Communication Theory. Fourteen other programs will be carried over from previous summers. Ernest H. Huntress is director of the Summer Session.

Stanford University School of Medicine will present the following postgraduate courses next summer: Cardiology, June 15–19; General Medicine, June 15–19; Surgery and Treatment of Fractures and Associated Trauma, June 24–26; General Surgery, June 22–26. Programs will be available from the office of the dean, 2398 Sacramento St., San Francisco 15, in March.

The **University of Texas** will offer a new course in its English Department to teach engineering and science students advanced technical writing and editing skills. John A. Walter, assistant professor, and technical reports editor for the university's Military Physics Research Laboratory, will teach the course.

A **Workshop on the Production and Use of Technical Reports** will be held at Catholic University of America, Apr. 13–18, under the sponsorship of the university, the Division of Chemical Literature of the American Chemical Society, the American Documentation Institute, the Special Libraries Association, and the National Science Foundation. Among the participants will be Alberto F. Thompson, Eugene Miller, Maurice F. Tauber, Dwight E. Gray, Robert E. Mixson, B. H. Weil, Martin E. Jansson, Robert C. Sale, Mortimer Taube, Karl Heumann, Jerrold Orne, and Fred E. Croxton. As attendance will be limited, notice of intention to attend must be received on or before *Apr. 1,* and should be addressed to James J. Kortendick, Department of Library Science, Catholic University, Washington, D. C.

Leaving from Guayaquil on Mar. 1, a **Yale University** oceanographic expedition, under the general supervision of Daniel Merriman, will spend three months investigating the Humboldt Current, ranging as far south as Antofagasta. Two deep-sea fishing craft, a laboratory ship, and a vessel for living quarters will comprise the expedition fleet. The research group will include Edward C. Migdalski, preparator and assistant in ichthyology at Yale; James E. Morrow, research assistant; Gerald S. Posner, laboratory assistant; Sarah B. Wheatland, laboratory technician; and Walter Chappelle, Jr., of Eastman Kodak Company, expedition photographer. Enrique Avila, ornithologist with the Guano Company, of Lima, Peru, will join the expedition for a short period.

Grants and Fellowships

A **Center for Advanced Study in Behavioral Sciences** will be established by the Ford Foundation. In a $3,500,000 six-year program, 50 scholars and scientists will assemble annually for study and collaboration at a site yet to be selected. Frank Stanton, president of the Columbia Broadcasting System, is chairman of the project; serving with him on the Board of Directors are Paul Buck, F. F. Hill, Clark Kerr, Robert K. Merton, Robert R. Sears, Alan T. Waterman, and Theodore Yntema.

Emerson Radio & Phonograph Corporation, 111 Eighth Ave., New York 11, has appointed a com-

mittee to pass on all applications made by educational institutions for the Emerson $100,000 educational television grant. The committee consists of James G. McDonald, former ambassador to Israel; Leonard Carmichael, secretary, Smithsonian Institution; and Orestes H. Caldwell, former FCC commissioner. The first ten stations to begin broadcasting on a channel allocated for noncommercial educational purposes will receive $10,000 each. Each applicant should send photostatic copies of the FCC license under which the station began broadcasting, as well as full details of its initial operations.

The **International Information Administration** will sponsor the exchange of 8000 persons between the U. S. and 72 other countries. In addition, IIA will encourage and assist some 500 organizations, institutions, and foreign governments in the exchange of another 8000 persons on similar projects. For information as to where to apply for grants, write to the Superintendent of Documents, U. S. GPO, Washington 25, D. C., for Department of State Pub. 4792, enclosing 10 cents in coin.

Eli Lilly and Company has provided funds for the work of Raymond P. Mariella, chairman of the Department of Chemistry, Loyola College, Chicago, in support of his research in pyridine chemistry. A grant awarded to Stephen Wythe, of the University of Michigan, has been renewed in support of his work on orange alkaloid alstoniline.

Massachusetts Institute of Technology is offering graduate and advanced research fellowships in electronics, sponsored jointly by a group of industrial organizations concerned with the advancement of electronics and its applications. Stipends range from $1500 to $2400 for student fellowships and from $3000 upward for advanced research. Applications should be filed at least four months prior to the intended date of entrance, with the director, Research Laboratory of Electronics. A limited number of positions as research assistants is also available in the laboratory.

The **National Science Foundation** has approved 78 grants, totaling $685,200, in the biological and the physical sciences and to support studies and conferences on science and scientific education. The duration of the grants ranges from 8 months to 3 years, and they average $5,475 per year each. Largest amounts were: $32,000 to Harvard, for research on "Radio Astronomy in the Microwave Region," under Bart J. Bok (2 years); $31,500 to the Academy of Natural Sciences of Philadelphia, for work on "Freshwater Diatoms of the United States," under Ruth Patrick (3 years); $30,000 to Yale, for research on "Hydroxyamino Acids in Protein Structure," under J. S. Fruton (3 years); and $25,000 to the Library of Congress for a compilation of lists of scientific and technical serial publications under the supervision of R. L. Zwemer (9 months).

Rockefeller Foundation grants for the fourth quarter of 1952 included $500,000 to MIT for research in biology, $225,000 to the Brookings Institution for a three-year program of research and education in international relations, $170,000 to the University of North Carolina for research in mathematical genetics at the Institute of Statistics, and £10,000 to University College, London, for the continued investigation, under J. Z. Young, of the selection and teaching of medical students.

Sigma Delta Epsilon, Graduate Women's Scientific Fraternity, gave its 1952 Research Award of $500 to Leila A. Dragonette, of the Department of Mathematics, University of Chicago, for her paper "Some Asymptotic Formulae for the Mock Theta Series of Ramanujan." Honorable mention was given to Margaret R. Murley, of the Department of Biological Sciences, Northwestern University, and Lela Barton, of the Boyce Thompson Institute for Plant Research.

In the Laboratories

Bio-Lab Breeding Inst., of Bainbridge, N. Y., and **Albino Farms,** of Red Bank, N. J., are merging their facilities and will operate under the combined name at Bainbridge. The consolidation will be under the direction of Leon C. Babcock.

Bronwill Scientific, Inc., 40 Worth St., New York 13, has been appointed exclusive U. S. agent and distributor for B. Braun, of Melsungen, Germany, producers of specialized laboratory instruments and medical and hospital supplies.

Cambridge Corporation, of Somerville, Mass., has elected William R. Morgan vice president of manufacturing and George A. Brooks treasurer. Roger S. Warner, Jr., of Boston, David H. Northrup, and Helge Holst were named to the Board of Directors. Cambridge Corporation, which is engaged in the engineering and manufacturing of equipment and products in the near absolute zero low-temperature field, is a jointly owned affiliate of Arthur D. Little and Carrier Corporation.

Consolidated Vacuum Corporation will operate the vacuum equipment department of Eastman Kodak's Distillation Products Industries, recently acquired by Consolidated Engineering Corporation, of Pasadena. Philip S. Fogg is president of the new corporation, as well as of Consolidated Engineering.

Arthur D. Little, Inc., will undertake an industrialization project in Egypt, under contract with the Department of State. Earl Stafford, Richard M. Alt, and A. G. Haldane, of the Little organization, and Thomas D. Cabot, who is serving temporarily with TCA, have left for Egypt to make a survey of the project.

Recent additions to the staff of the **Miner Laboratories,** Chicago, are Donald A. Krummel, formerly of the Glidden Company; Ezra H. Biteover, of Lindsay

Chemical Company; and Abraham Ravve, of Illinois Institute of Technology.

R. J. Reynolds Tobacco Company dedicated its new $2,000,000 Research Laboratory Feb. 5. Ernest W. Reid, president of Corn Products Refining Company, delivered the principal address. Among other visitors taking part were Walter J. Murphy and Paul M. Gross.

Meetings and Elections

The **American Association of Petroleum Geologists** has elected John Emery Adams, senior geologist, Standard Oil of Texas, president; Leslie M. Clark, of Pacific Petroleums, Ltd., vice president; Elliott H. Powers, of Southern Production Company, Inc., vice president; and Armand J. Eardley, University of Utah, editor of the *Bulletin*. The new officers will assume their posts at the close of the annual meeting in Houston, Mar. 22–26.

The annual meeting of the **American Congress on Surveying and Mapping** will be held at the Hotel Shoreham, Washington, D. C., Mar. 23–25, with "Map Uses" and "Engineering Surveys and Maps" as the main themes. Exhibits will be open to the public without charge during the three days and from 6:00 until 9:00 P. M., Monday, Mar. 23.

The **American Physical Society** Division of High-Polymer Physics will hold a Symposium on Crystallization in Polymers during the annual meeting of the parent society in Durham and Chapel Hill, N. C., Mar. 26–28. Raymond F. Boyer has been elected division chairman, and John D. Ferry, vice-chairman. W. J. Lyons was re-elected secretary-treasurer.

The **Association of Southeastern Biologists** will hold its annual meeting Apr. 16–18 on the campus of the University of North Carolina, jointly with the Southeastern Section of the Botanical Society of America and the Southern Appalachian Botanical Club. The Annual Association Research Prize, sponsored by the Carolina Biological Supply Company, will be presented during the meeting. At the same time a new Research Fellowship at Mountain Lake Biological Station, established with funds received from the Phipps and Bird Company, will be awarded.

The eighteenth **Cold Spring Harbor Symposium on Quantitative Biology** will be held June 5–11, with "Viruses" as the subject for discussion. Participants from abroad will include J. C. Appleby, W. Hayes, R. Markham, and F. K. Sanders (England); F. Jacob and A. Lwoff (France); and W. Weidel (Germany). For program and information address the Biological Laboratory, Cold Spring Harbor, N. Y.

The **XIIIth International Congress of Pure and Applied Chemistry** will be held in Stockholm July 29–Aug. 4, in connection with the **XVIIth Conference of the International Union of Pure and Applied Chemistry**. There will be a symposium on wood chemistry in Stockholm, and immediately after the congress a symposium on macromolecular chemistry in Uppsala. Applications should be sent to reach the general secretary, Bengt Sandberg, c/o the congress, Stockholm 70, Sweden, not later than *Mar. 1*.

The **Torrey Botanical Club** elected the following officers at its annual meeting in January: president, Jennie L. S. Simpson; vice presidents, Murray F. Buell and Clyde Chandler; secretaries, Eleanor Witkus and Donald P. Rogers; treasurer, Elva Lawton; AAAS Council representatives, Murray F. Buell and Marion A. Johnson.

Miscellaneous

The **American Psychological Association**, financed by a grant from the National Science Foundation, is embarking on a three-year analysis of psychologists and of the ideas, facts, and general content of psychology. Under the supervision of a committee headed by Dael Wolfle, Sigmund Koch, of Duke University, who is now at the University of London on a Fulbright scholarship, will be in charge of the latter project. Kenneth Clark, of the University of Minnesota, will direct the study that will deal with matters of personnel and training, and the relations of psychologists to universities, other professions, and the agencies that make use of psychological services. Clarence H. Graham, Lyle H. Lanier, Robert B. MacLeod, Eliot Rodnick, M. Brewster Smith, and Robert L. Thorndike are members of the supervisory committee.

The **International Committee of Weights and Measures**, meeting in Paris, has established a new advisory committee, "Le Comité Consultatif pour la Définition du Mètre," of which R. H. Field, head of the Metrology Laboratory, Division of Physics, National Research Council of Canada, was elected head. The committee has the task of determining the advisability of defining the International Meter in terms of a wavelength of light instead of the platinum-iridium bar that has served since the 1880s as the basic standard for all scientific measurements involving length. The committee will represent the national standardizing bodies of Canada, France, Germany, Great Britain, Italy, Japan, Russia, and the United States, as well as the International Bureau of Weights and Measures, the International Association of Geodesy, the International Astronomical Union, and the International Union of Pure and Applied Physics.

The **Wenner-Gren Foundation** will present its Viking Fund Medals and Awards for 1952 at a dinner at the Waldorf-Astoria on Mar. 6. Julian H. Steward is the medalist in general anthropology (chosen by the American Anthropological Association); Alfonso Caso, the medalist in archaeology (chosen by the Society for American Archaeology); and William L. Straus, Jr., the medalist in physical anthropology (chosen by the American Association of Physical Anthropologists).

Association Business

Howard A. Meyerhoff, *Administrative Secretary*

Administrative Officers

THE general, or elected, officers of the Association for 1953 were announced in the January 16 issue of SCIENCE (p. 3, advertising section). Several changes have also occurred in the roster of administrative officers as listed in the July 4, 1952, issue of SCIENCE (p. 3, advertising section). These changes are incorporated in the ensuing current directory, to which the names of the officers of the Divisions are also appended:

In Washington at 1515 Massachusetts Ave., N.W.:

Administrative Secretary: Howard A. Meyerhoff
Assistant Administrative Secretaries:
Raymond L. Taylor
John A. Behnke
Business Manager: Hans Nussbaum
Executive Editor: Gladys M. Keener

Section Secretaries:

Section A (Mathematics): Rudolph E. Langer, University of Wisconsin, Madison
Section B (Physics): Fred L. Mohler, National Bureau of Standards, Washington 25, D. C.
Section C (Chemistry); Edward P. Degering, 1860 Colonial Drive, Memphis, Tennessee
Section D (Astronomy): Frank K. Edmondson, Indiana University, Bloomington, Indiana
Section E (Geology and Geography): Jack B. Graham, U. S. Geological Survey, Washington 25, D. C.
Section F (Zoological Sciences): J. H. Bodine, University of Iowa, Iowa City, Iowa
Section G (Botanical Sciences): Stanley A. Cain, University of Michigan, Ann Arbor, Michigan
Section H (Anthropology): Gabriel Lasker, Wayne University College of Medicine, 1512 St. Antoine St., Detroit 26, Michigan
Section I (Psychology): William D. Neff, University of Chicago, Chicago, Illinois
Section K (Social and Economic Sciences): Conrad Taeuber, Bureau of the Census, Washington, D. C.
Section L (History and Philosophy of Science): Raymond J. Seeger, National Science Foundation, Washington 25, D. C.
Section M (Engineering): Frank D. Carvin, Illinois Institute of Technology, Chicago, Illinois
Section N (Medical Sciences):
Subsection Nm (Medicine): Allan Bass, Vanderbilt University School of Medicine, Nashville, Tennessee
Subsection Nd (Dentistry): Russell W. Bunting, University of Michigan, Ann Arbor, Michigan
Subsection Np (Pharmacy): Glenn L. Jenkins, Purdue University, Lafayette, Indiana
Section O (Agriculture): C. E. Millar, Michigan State College, East Lansing, Michigan
Section P (Industrial Science): Allen T. Bonnell, Drexel Institute of Technology, Philadelphia, Pennsylvania
Section Q (Education): Dean A. Worcester, University of Nebraska, Lincoln, Nebraska

Officers of the Pacific Division:

President: C. D. Shane, Lick Observatory, Mt. Hamilton, California
President-elect: A. H. Sturtevant, California Institute of Technology, Pasadena, California
Secretary: R. C. Miller, California Academy of Sciences, San Francisco, California

Officers of the Southwestern Division:

President: Edna L. Johnson, University of Colorado, Boulder, Colorado
Vice President: Paul E. Boucher, Colorado College, Colorado Springs, Colorado
Secretary: Frank E. E. Germann, University of Colorado, Boulder, Colorado

Officers of the Alaska Division:

President: C. T. Elvey, University of Alaska, College, Alaska
Vice President: Ivar Skarland, University of Alaska, College, Alaska
Secretary-Treasurer: Dorothy Jean Thompson, Box 183, Fairbanks, Alaska

Council

At the meetings of the Council held in St. Louis on December 27 and 30, in addition to the election of officers, the following business was transacted:

1. Kirtley F. Mather, on behalf of the Committee on the Revision of the Constitution and Bylaws, presented a final report to the Council. On motion, duly seconded, it was voted that the reading of the revised constitution and bylaws as printed on pages 575–78 of the November 21, 1952, issue of SCIENCE be dispensed with. Following a review of the changes involved in the revised constitution and announcement of one minor editorial transposition, Dr. Mather moved the adoption of the constitution as printed. The motion was seconded and passed without dissenting vote. The chairman declared the revised constitution adopted in accordance with the requirement of a nine-tenths vote of those present and voting (SCIENCE, 117, 117 [1953]).

Following a discussion of the new bylaws, it was moved and seconded that they be adopted as printed on pages 575–78 of the November 21, 1952, issue of SCIENCE. Dr. Miller moved to amend Article XII by adding the following sentence: "Changes made in the bylaws by the Board of Directors shall be subject to approval, by majority vote, of the Council." The motion was seconded by Dr. Schmitt and passed. As thus amended, the motion to adopt the bylaws was voted. On motion, duly seconded, it was formally voted that the Constitution and Bylaws, as adopted by the Council on December 27, shall become effective on January 27, 1953.

2. John R. Dunning reported for the Building Com-

mittee, detailing the uncertainties created by the refusal of the District of Columbia Zoning Board to permit the construction of a headquarters building on the Scott Circle site now owned by the Association, and he outlined the possible courses of action. It was moved, seconded, and voted to approve the committee's report and to authorize the committee to proceed in its present task of finding a satisfactory solution to the problem created by the Zoning Board's adverse action.

3. The Administrative Secretary reported on Association activities relative to the McCarran Act of 1950, and a preliminary analysis of the implications of the McCarran-Walter Act of 1952, prepared by William A. W. Krebs and Carmel P. Ebb, of the National Science Foundation, was distributed for consideration. It is proposed to print the analysis in SCIENCE and to publish statements made by Drs. Painter (ACLS), Waterman (NSF), and Meyerhoff (AAAS) before the President's Commission on Immigration and Naturalization in THE SCIENTIFIC MONTHLY (76, 11 [1953]). Although there has been some clarification in the administration of the act in 1952, the passport-visa situation remains essentially unchanged, and improvement cannot be anticipated in the immediate future. (See *Whom We Shall Welcome: Report of the President's Commission on Immigration and Naturalization*, January 1, 1953, pp. 66–71.)

4. *a*) Dr. Mather, as Chairman of the Executive Committee, briefly reported on Association activities and finances for 1952, and on motion, duly seconded, the Council voted to accept his report.

b) The Administrative Secretary reported on the business affairs of the Association, noting especially the need for Council cooperation in increasing Association membership.

c) and *d*) Dr. Meyerhoff reported for the Publications Committee in Dr. Payne's absence, combining this report with that of the Chairman of the Editorial Board. Publication of the booklet on *Industrial Science* and the symposium on *Soviet Science* was noted, and the continuing growth in the circulation of THE SCIENTIFIC MONTHLY as contrasted with the static circulation of SCIENCE was tentatively related to the editorial policy of publishing more material of a controversial character in the former. Failure of scientists in certain fields to make appropriate and adequate use of SCIENCE was stressed.

e) In the absence of Dr. Domm, the Administrative Secretary reported that the Committee on Affiliation and Association favorably recommended, and the Executive Committee approved, affiliated status for the following organizations:

American Association of Clinical Chemists, Inc.
American Ethnological Society, Inc.
Hawaiian Academy of Science
Society of Exploration Geophysicists
Southern Association of Science and Industry

and associated status for

The National Wildlife Federation.

It was voted to accept the Committee's recommendations and to ratify the action of the Executive Committee.

f) Dr. Meister reported for the Cooperative Committee on the Teaching of Science and Mathematics, recounting actions taken at the spring and fall meetings of the committee and describing the committee's current interest in the talented student.

5. The schedule of future annual meetings was announced as

1953—Boston
1954—San Francisco, with the Berkeley campus of the University of California as the probable center of activities
1955—Chicago
1956—New York

6. At the request of the chairman, Ralph W. Lefler reported on the condition of J. C. Strachan, teacher from Toronto, who was stabbed and robbed while returning to his St. Louis hotel from one of the sessions. Mr. Strachan's response to the Council's action merits incorporation in these minutes:

I want to express to you, and through you to the members of your group, my deepest appreciation for the generous cheque delivered to me while in hospital in St. Louis. The flowers, too, were beautiful and most cheering.

Although my accident was unfortunate, the members of the AAAS, the hospital staff and many others, complete strangers, showed me the utmost kindness and thoughtfulness. The collection from your group of a fund to help me was a very friendly gesture and, I may say, is most acceptable, not only to defray the medical expenses but to help replace my clothes, which were ruined. If there is any way in which you can convey my appreciation to the members of your group, I would be most happy.

The memories I shall keep of St. Louis will be of the hundreds of friendly good wishes I received and the practical assistance offered. It is one more example of the famous American hospitality and generosity.

You may be interested to know that I was able to return home on New Year's Day and after a couple of weeks rest at home I am expected to be as good as new with no permanent ill effects.

Yours very sincerely,
J. C. STRACHAN

7. Dr. Mather, for the Executive Committee, discussed the need for official Council action, legalizing the transformation of the present Executive Committee to the Board of Directors under the revised constitution. To this end he introduced the following motion, which was seconded by Clarence E. Davies and unanimously voted:

The members of the Executive Committee in office on January 15, 1953, shall continue as members of the Board of Directors for the remaining portions of the terms of service to which each had been elected prior to that date. Thus the Executive Committee as constituted under the constitution which is in force until January 27, 1953, will become the Board of Directors as constituted under the new constitution effective on that date.

8. By standing vote the Council adopted minutes in tribute to Howard W. Blakeslee, Edwin Grant Conklin, and Forest Ray Moulton.

Dr. Bronk announced that, although the official year of the Association ends on January 14, he wished to welcome his successor, E. U. Condon, into the office of president. Dr. Bronk's act was approved by a standing vote of all Council members present.

Finances

Condensed statements of Association finances for the year 1951, prepared by the auditing firm of G. P. Graham & Company, are published herewith, in order that the entire membership may be fully informed regarding the financial operations, obligations, and resources of the AAAS.

The first two statements summarize operating re-

ceipts and expenditures. Once again the annuity payments to the Cattell estates for SCIENCE were drawn from the excess of receipts over expenditures in the operating account. The remainder of the excess is available as a reserve against future annuity payments, which included a stipulated amount of $34,210.99, plus an inflation adjustment that would total $28,794.24, if computed at the 1951 rate.

The last two statements summarize the status of investment and trust funds. The increase of $37,000 as compared with 1951 is in large part accounted for by the bequest of $25,000, used to establish the Newcomb Cleveland Fund for the administration of the $1000 prize. The value of investments and the amount of investment income both increased to a gratifying extent in 1951, thanks to sound investment policies and management, but the total endowment is still meager in comparison with the magnitude of the responsibilities the Association should assume in advancing science.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
OPERATING FUND
BALANCE SHEET AS AT DECEMBER 31, 1951

Assets

Current assets		
Cash	$192,384.62	
Accounts receivable	22,232.21	
U. S. Teasury bills	283,833.95	
U. S. Treasury bonds	244,609.38	$743,060.16
		$743,060.16

Liabilities

Current liabilities		
Accounts payable		$ 55,928.68
Deferred income		
Prepaid dues and fees	$204,675.32	
Prepaid journal subscriptions	49,717.36	254,392.68
Reserve fund		250,000.00
Unallocated funds (Net worth)		
Balance January 1, 1951	$303,742.03	
Add: Excess of receipts over expenditures	128,998.77	
	$432,740.80	
Deduct: Transfer to reserve fund	250,000.00	
Balance December 31, 1951		182,740.80
		$743,060.16

Note: The journal SCIENCE was acquired in 1944 at a stated cost of $166,430.69, payable over a period of ten years, together with such additional amounts as may be determined each year under the inflation clause of the contract. Total payments to December 31, 1951, amounted to $205,143.35. No liability has been shown on the above statement for the balance of $34,210.99 which is payable on the stated cost price of the journal. The amount due under the inflation clause on the balance of the contract computed at the 1951 rate would amount to $28,794.24.

Washington, D. C.
June 16, 1952

To the Council of the
American Association for the Advancement
of Science
Washington, D. C.

We have examined the balance sheet of the Operating Fund of the American Association for the Advancement of Science as at December 31, 1951, and the statement of receipts and expenditures for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements as supplemented by the notes thereto present fairly the financial position of the Operating Fund of the American Association for the Advancement of Science as at December 31, 1951, and the results of its operations for the year then ended.

G. P. GRAHAM & COMPANY
By H. A. O'Neill

American Association for the Advancement of Science
Operating Fund

Statement of Receipts and Expenditures for the Year Ended December 31, 1951

Receipts			
Dues and entrance fees			$277,973.07
Journals			
Subscriptions			
From Treasurer's accounts (life, 50-year, and emeritus members)	$ 2,844.00		
Members' special subscriptions	17,605.10		
Nonmember subscriptions	58,758.98	$ 79,208.08	
Advertising		151.819.57	
Miscellaneous sales		2,620.46	233,648.11
Publications			
Binders		$ 1,066.14	
Symposium volumes		13,217.92	
Proceedings and directory		2,465.78	16,749.84
Philadelphia meeting and exhibit			40,389.73
Rental income			2,808.01
Income from investments			6,366.04
Miscellaneous			874.29
			$578,809.09
Expenditures			
Administrative and general expense		$ 61,324.03	
Building expense		4,495.71	
Executive committee		6,133.87	
Allowance to divisions		6,497.00	
Section expense		3,215.80	
Circularization—new members		11,177.93	
Meetings and exhibits		32,243.79	
Journals		274,196.29	
Publications		10,335.55	
Employees' retirement plan		7,802.86	
Social security		1,001.03	
Miscellaneous		735.53	
Annuity			
1951 Science annuity	$16,643.04		
Inflation allowance on annuity	14,007.89	30,650.93	449,810.32
Excess of Receipts over Expenditures			$128,998.77

Washington, D. C.
June 16, 1952

To the Council of the
American Association for the Advancement of Science
Washington, D. C.

We have examined the balance sheet of the Treasurer's accounts of the American Association for the Advancement of Science as at December 31, 1951, and the statement of cash receipts and disbursements for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements present fairly the financial position of the Treasurer's accounts of the American Association for the Advancement of Science as at December 31, 1951, and the cash receipts and disbursements for the year then ended.

G. P. Graham & Company
By H. A. O'Neill

American Association for the Advancement of Science
Treasurer's Accounts

Balance Sheet as at December 31, 1951

Assets

Endowment and reserve funds			
Cash awaiting investment		$ 13,120.42	
Securities		268,784.47	$281,904.89
Building fund			
Cash		$ 14,581.77	
Securities		12.50	
Real estate			
1515 Massachusetts Avenue	$59,334.15		
Other	93,963.05	153,297.20	167,891.47
Newcomb Cleveland prize fund			
Cash			25,000.00
Current funds			
Cash			$27,943.87
			$502,740.23

Liabilities and Reserves

Endowment and reserve funds			
For research		$121,966.15	
For general purposes		104,927.25	
For special purposes		9,025.00	
Treasurer's reserve		45,986.49	$281,904.89
Building fund			167,891.47
Newcomb Cleveland prize fund			25,000.00
Current funds			
Liabilities			
Academy grants	$ 3,251.00		
Special academy grants	200.00		
Sociology prize fund	2,500.00		
Westinghouse Science Writers' Award fund	1,849.11		
AAAS—UNESCO fellowship fund	53.50	$ 7,853.61	
Unappropriated income			
For research	$ 3,828.21		
For general purposes	3,293.74		
Jane M. Smith fund	900.07		
Luella A. Owen fund	20.26		
A. G. Stillhamer fund	918.10		
Unexpended balances of previous years	11,129.88	20,090.26	27,943.87
			$502,740.23

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
TREASURER'S ACCOUNTS

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1951

Cash balances January 1, 1951			$ 23,190.29
Receipts			
Endowment and reserve funds			
Life membership fees	$ 2,400.00		
Income added to reserve fund			
Interest and dividends allocated	1,198.90		
Gain on sales of securities	6,868.72		
Redemption and sales of securities	404,083.45		
Gifts—Friends of the Association	503.50	$415,054.57	
Building fund			
Contributions		25.00	
Newcomb Cleveland prize fund			
Bequest received	$ 23,000.00		
Transfer from current fund	2,000.00	25,000.00	
Current fund			
Contributions received for Special academy grants	$ 400.00		
Prize in sociology	2,500.00		
Thousand dollar prize fund	1,000.00		
Westinghouse Science Writers' Award fund	7,500.00		
Income from investments	8,606.59		
Deceased emeritus life membership fees	1,250.00	21,256.59	461,336.16
			$484,526.45
Disbursements			
Endowment and reserve funds			
Fees of deceased emeritus life members transferred to Jane M. Smith fund income	$ 1,250.00		
Securities purchased	383,792.26	$385,042.26	
Building fund			
Miscellaneous		96.98	
Current fund			
Westinghouse Science Writers' Award fund	$ 6,206.63		
Thousand Dollar Prize fund	1,000.00		
Income allocated to Treasurer's reserve	1,198.90		
Special academy grants	400.00		
Academy grants	3,675.55		
Emeritus life members (income—Jane M. Smith fund)	1,050.00		
Journal subscriptions (life, 50-year, and emeritus members)	2,844.00		
Transfer to Newcomb Cleveland Prize fund	2,000.00		
Expenses	366.07	18,741.15	403,880.39
Cash balances December 31, 1951			
For investment		$ 13,120.42	
For building fund		14,581.77	
For special prize fund		25,000.00	
For current purposes		27,943.87	$80,646.06

AAAS Membership

1. *Changes during 1952*

New members		5,176
Deaths	344	
Resignations	1,893	
Automatic resignations	2,692	
Total outgoing		4,929
Net increase during 1952		247

2. *Totals as of 31 December 1952*

Paid for 1952	33,545
Paid through June 1953	9,978
Life members, etc.	708
In good standing	44,231
In arrears	3,036
	47,267
New for 1953	1,473
Total membership	48,740

Public Information at St. Louis

Sidney S. Negus

Director of Public Information

AS USUAL, the several secretaries, program chairmen, and authors of papers were most helpful to the Association's department of public information prior to and during the St. Louis meeting. The local committee on public information, headed by Howard A. Marple, of the Monsanto Chemical Company, set a standard for the coverage of the meeting by St. Louis newspapers that will be difficult to excel in cities where the Association will meet in the future. Local radio and television programs, arranged by Barbara Callahan, of the St. Louis University School of Medicine public relations department, and several coast-to-coast broadcasts equaled or bettered previous air coverage of a AAAS meeting.

Not as many reporters from local dailies were on hand as in New York and Philadelphia, but the total number of reporters requesting papers in advance of presentation (178) was greater than for the Philadelphia (162) and Cleveland (148) meetings. Probably the New York record (252) will not be equaled until the Association meets there again.

Since the Association does not subscribe to a clipping service, it must depend upon random sampling and reports sent in by interested individuals for an estimate of how widely AAAS news stories are published over the world. From clippings thus far received from many publications in this country and abroad, we are justified in concluding that the world-wide coverage was on a par with previous meetings, excluding the one held in New York in 1949. The ego of this department is always considerably deflated, however, when it is pointed out—and rightly so—that there is usually comparatively little news to print between Christmas and New Year's Day!

For assistance in the press room at St. Louis we are grateful to Gregory Lucy, sales manager of the Hotel Jefferson, and to his many hospitable employees who supplied us with every necessary service quickly and cheerfully; to the Monsanto Chemical Company, Washington University, St. Louis University, and the American Tobacco Company Research Laboratory for providing luncheons for representatives of the press, radio, and television each day in the press room; to the Westinghouse Educational Foundation for its recognition of the importance of good science reporting by its two annual awards and its reception, luncheon, and program for the press; to the General Electric Company for holding open house each evening for all science reporters in attendance; to the Southwestern Bell Telephone Company and the Virginia Academy of Science for contributing the services of press room assistants; and to members of the National Association of Science Writers for invaluable technical advice.

In the last analysis, as pointed out in our report last year for the Philadelphia meeting (SCIENCE, **115**, 177 [1952]), especial appreciation must be accorded the reporters who covered the meeting. It is they who will ultimately make it possible for the Association to carry out one of its principal purposes: "To increase public understanding and appreciation of the importance and promise of the methods of science in human progress."

A Report of the St. Louis Meeting December 26–31, 1952

Raymond L. Taylor
Assistant Administrative Secretary, AAAS

GOOD weather, the enthusiastic cooperation and interest of St. Louis citizens, and warm hospitality on the part of local scientists combined to make the 119th meeting of the American Association for the Advancement of Science a decidedly pleasant and memorable occasion. The Academy of Science of St. Louis arranged a luncheon at which the Executive Committee and administrative staff of the Association were guests, and many resident scientists invited out-of-town speakers and colleagues to their homes. Apart from its friendliness, this annual meeting of the AAAS was one of the most important and significant conventions in the long history of the Association, now in its 105th year.

The sixth St. Louis meeting was noteworthy in more than one respect. Among the items of business transacted in the two sessions of the Council, at which 106 members were present, was the adoption, by unanimous vote, of a sixth constitution and a new set of bylaws that will, it is hoped, enable the Association more efficiently to continue its work of advancing science. The Academy Conference, with 29 academies officially represented, had a particularly successful series of sessions. This recurrent conference and the Conference on Scientific Manpower were joined this year by a Conference on Scientific Editorial Problems, which was so well received that the participants decided to organize it, also, to continue at future AAAS meetings. The special sessions, which add so much to the meetings each year—the distinguished evening addresses sponsored by the American Mathematical Society, the National Geographic Society, the Scientific Research Society of America, the Society of the Sigma Xi, and the United Chapters of Phi Beta Kappa, as well as the presidential address of the AAAS itself—attracted large and appreciative audiences. The AAAS Science Theatre, which showed the latest in foreign and domestic scientific films, was consistently well patronized. The Annual Exposition of Science and Industry, with 72 exhibitors and 116 booths filling Convention Hall of the Kiel Auditorium and overflowing into the promenade, was up to the high standard of recent years and drew an appreciative audience. There were programs in all principal fields of science and there was a universal concurrence of opinion regarding their high quality. All these aspects of the meeting merit more than passing mention.

Symposia. The number and quality of the symposia were impressive. The three general symposia were much more than reviews of the literature of their subjects. "Disaster Recovery," with eminent authorities from a variety of fields, analyzed the characteristics of natural and man-made disasters and examined the common principles of recovery. "Applications of the Theory of Games" pleased the mathematicians and statisticians, and interested the laymen who attended. In "The Nation's Nutrition," eight national leaders in the field presented, primarily, their own most recent research. With highly qualified discussants in addition, this program commanded a gratified audience that exceeded two hundred in number.

Another highlight of the meetings—an innovation that proved popular and will be repeated—was the series of four public discussion book panels arranged by the Society of Systematic Zoology and cosponsored by Section F. These sessions, set up in TV fashion with authors and discussants present, drew audiences approaching two hundred. Audience participation was encouraged and, in one of the panels on evolution, spirited discussion prolonged the session long beyond the scheduled time.

The 18 sections and subsections of the Association, together with the 35 participating societies and other organizations that had programs of their own, arranged 62 symposia and panel discussions—a record-breaking total that surpassed the previous high of 42 at the Philadelphia meeting of 1951. All were of high caliber, but with 90 sessions and 381 speakers, there was competition that cut attendance at some programs during the four-day period in which most of them were concentrated. Most program chairmen expressed satisfaction with the attendance.

The proportion of symposium papers to short contributed papers was high because relatively few of the larger scientific societies met with the Association this year. Of the 53 organizations that participated, 35 had programs of their own and, of these, only 24 had sessions for contributed papers. For many of these participating groups, however, either it was not their national meeting or their memberships are modest in size. Their participation, it should be emphasized, manifested their interest in the AAAS and the work it is doing, and their contributions were substantial.

At St. Louis, the emphasis on symposia and panels constituted a further advance toward the point of view developed in the Arden House Conference—that AAAS meetings should offer programs that not only will provide opportunities to integrate the several scientific disciplines but will also serve to increase public understanding and support of science. How best to attain these worthy objectives merits careful study. A general symposium, planned in part for intelligent laymen who are local residents, must have a strong special appeal if it is to compete successfully with the daily routine and social habits of business and professional persons. A technical symposium can be expected to attract specialists but it is handicapped if it stands alone and is not supported by paper-reading sessions in the same field. Individual scientists, who attend a scientific meeting primarily to read a paper and to hear several others in their specialty, constitute an important and receptive audience for symposia that integrate the sciences, develop neglected interdisciplinary areas, or deal with problems of common concern to all scientists. The number present at a AAAS meeting is in direct proportion to the number of contributed papers. At St. Louis ten AAAS sections contributed substantially to the attendance by arranging 25 sessions at which 165 contributed papers were read. Indeed, the 24 societies that had scheduled 54 sessions for paper-reading reported only an additional 209 short papers, of which 94 were given before the three mathematical societies.

A number of section secretaries and others interested in scientific meetings have independently reached the following basic conclusions:

1. Most people go to meetings primarily to see other people in their own or allied fields.
2. The reading of a paper commonly means financial assistance to the author in getting to the meeting.
3. Advance publication of the program, by providing a partial list of those who will be present, stimulates attendance.
4. Once at the meeting, the individual scientist enjoys the symposia and general sessions that are available, but only exceptionally can a scientist afford to attend symposia at a meeting in which sessions for contributed papers in his field are nonexistent.

As long as a AAAS meeting has a core of sessions for contributed papers, a good potential "core attendance" for symposia is assured, and it is gratifying to know that the number of contributed papers will increase at the AAAS Boston meeting of December 26–31, 1953, because full-scale national meetings of the American Society of Zoologists, the American Society of Naturalists, the Genetics Society of America, the American Society of Human Genetics, not to mention sessions of other societies, are scheduled to take place in conjunction with the 120th meeting of the Association.

Participating societies at St. Louis. In addition to the 18 sections and subsections of the Association, a total of 53 societies and other organizations officially participated in the 119th meeting.

An analysis of the 264 separate sessions of the St. Louis meeting yields some interesting statistics (Table 1).

TABLE 1

Number of sessions for contributed papers	79
Number of symposia and panels	95
Number of business sessions	32
Number of meal functions (at many of which addresses were given or business transacted)	27
Number of round-table sessions or conferences	10
Number of sessions devoted exclusively to addresses	21
Total	264

There were at least 912 speakers, including authors of contributed papers, 374; authors of symposium papers and panel members, 403; discussants, 83; speakers giving introductions and principal addresses, 52.

Attendance. The official number of registrants (exclusive of representatives of the press, exhibitor personnel, and others who assisted with the conduct of the meeting) was 1938. At first thought, this may seem to be an exceptionally low number for a AAAS meeting, whereas, actually, this figure does not compare unfavorably with past meetings in St. Louis, nor does it even approximate the total attendance. Two experiments apparently account for the low registration: One was the sale of copies of the General Program–Directory to institutions and to individuals, separately, at cost ($1.50), without requiring registration. Programs sold in this way totaled 626. Although not every purchaser attended the meeting, there is reason to believe that a substantial number did, without completing their registration by paying an additional dollar for a convention badge. Second, because of the high degree of local support and cooperation, President Bronk proclaimed that all sessions of the meeting would be thrown open to interested adults and college students in Greater St. Louis. This proclamation, which was widely publicized locally, brought many persons, at least to the special sessions and the exposition, who otherwise might not have come at all. At the same hour on Monday evening, Dec. 29, for example, the National Geographic lecture in the Opera House had an audience of 3400; the Sigma Xi address in the Gold Room of the Hotel Jefferson enjoyed an attendance of 1000; the mathematicians' dinner had several hundred; more than 100 geologists were at Washington University; the science teachers had events at the Hotel De Soto; and there were scheduled sessions in psychology, the social sciences, and medicine. It is a conservative estimate that during the meeting a total of 8000 different persons attended one or more phases of the meeting.

TABLE 2

DISTRIBUTION OF REGISTRANTS BY STATES AND COUNTRIES

Alabama	15	North Carolina	10
Arizona	1	North Dakota	2
Arkansas	21	Ohio	86
California	40	Oklahoma	28
Colorado	23	Oregon	4
Connecticut	20	Pennsylvania	45
Delaware	3	Rhode Island	7
District of Columbia	60	South Carolina	3
Florida	15	South Dakota	6
Georgia	5	Tennessee	34
Idaho	5	Texas	36
Illinois	265	Utah	9
Indiana	80	Vermont	1
Iowa	57	Virginia	31
Kansas	55	Washington	6
Kentucky	15	West Virginia	9
Louisiana	17	Wisconsin	40
Maryland	42	Canada	14
Massachusetts	25	Cuba	1
Michigan	76	England	1
Minnesota	37	Finland	1
Mississippi	11	India	1
Missouri	495	Israel	2
Montana	5	Mexico	1
Nebraska	32	New Zealand	1
New Jersey	32	Philippines	1
New Mexico	2	Venezuela	1
New York	103	Total	1938

The registration totals for the two previous meetings in St. Louis—2649 (March 1946) and 2292 (December 1935)—afford an interesting comparison. At these two earlier meetings, the botanical societies, the entomologists, the parasitologists, the geneticists, the horticulturists, the American Society of Zoologists, and other societies all held their annual national meetings with the AAAS. In 1952, without any of these organizations participating, registration was only 700 lower than the registration at the fifth St. Louis meeting in 1946. If allowance is made for the effects of the separate sale of programs and the proclamation of an open meeting, this year's attendance may have been considerably larger than that of March 1946.

At the Philadelphia meeting in 1951, the registration of 3702 exceeded the 3339 registrants of the 1940 meeting in that city, despite the fact that most of the societies mentioned above, and still others, took part in 1940 but not in 1951. Thus, for two consecutive years, it has been demonstrated that, with a core of paper-reading sessions in the sciences proper, there is an audience for the symposia, the conferences, and the special sessions that are distinctive features of the annual meeting of the

Association. Analyses of the registration, geographically and by subject fields are given in Tables 2 and 3.

TABLE 3

SUBJECT FIELDS OF REGISTRANTS

Mathematics	46
Physical Sciences	
Astronomy	16
Physics	116
Chemistry	204
Geology and Geography	106
Engineering	65
Biological Sciences	
Botanical Sciences	198
Industrial Microbiology	32
Zoology	244
Other Biology	88
Medical Sciences	
Dental Research	36
Pharmacy	65
Other Medicine	317
Psychology	72
Anthropology	29
Social Sciences	47
Science Teaching and Education	174
General	83
Total	1938

An inspection of these data indicates that the 119th meeting was definitely a national meeting, with only four states (Maine, New Hampshire, Nevada, and Wyoming) unrepresented.

Detailed comment on the analysis of subject fields seems unnecessary. Two of the paradoxes of the registration are the small number of mathematicians, not withstanding the fact that the mathematical societies officially met with the AAAS, and the large number of botanists, with not a single botanical society meeting with the Association.

Physical arrangements. The excellent facilities of the Kiel Auditorium, within a short walking distance of the downtown hotels, and with its 16 session rooms, made it possible to schedule the three general symposia and nearly all the many sectional programs there, in proximity to the Main Registration-Information Center, the Visible Directory of Registrants, the Science Theatre, and the Exposition. The general policy of offering participating societies a choice of session rooms on a campus or in a hotel, and of consulting society officers on their hotel preferences, again was followed. In this way, it was decided that the three mathematical societies would utilize classrooms at Washington University for their sessions and the hotels Chase, Roosevelt, Melbourne, and Sheraton for sleeping accommodations. The Society of Systematic Zoology and other biological organizations, as well as the medical groups, were based at the Hotel Statler. The three science teaching societies, which chose the Hotel De Soto, used it so intensively that it was necessary to hold a few of their sessions in other nearby hotels. All other sessions were concentrated in the Hotel Jefferson, the headquarters of the Association and of the press. The Lennox, Mayfair, Mark Twain, Majestic, and Claridge hotels were used for supplementary sleeping room accommodations.

Projection requirements were heavy, but no participating society was asked to share in the considerable cost of projection. The Association is indebted to the St. Louis Board of Education, which generously provided all the equipment used, except for several screens in the hotels and the special equipment in the Science Theatre, which were rented. The Association is grateful to Warren K. Begeman, director of Adult and Technical Education, St. Louis Board of Education, for taking complete responsibility for the assembling, distribution, operation, and return of the machines and screens, for making arrangements with the projectionists, a majority of whom were professionals, and for his indefatigable supervision during the meeting. There were several instances of last-minute requests for projection but, so far as is known, in no case was there any real failure to meet the exacting and diverse requirements.

Housing and registration were handled by the staff of the St. Louis Convention Bureau under the general supervision of Fred H. Rein, manager. Copies of all confirmations of hotel room reservations not only went to those who made them but also came to the Washington office of the AAAS. The writer is thus well able to testify to the efficient manner in which these were handled. A new schedule of hotel room rates, necessitated by new contracts with the unions of the hotel workers, went into effect some months after the publication of rates in SCIENCE and THE SCIENTIFIC MONTHLY. Despite this, the bureau and the hotels cooperated to provide accommodations at the rates requested. Supplementary registration facilities were established at the hotels Jefferson, Statler, and De Soto, and also at Washington University, for the first four days of the meeting. In spite of the strain on the resources of the bureau, this phase of the meeting was handled with flawless efficiency.

The Biologists' Smoker. The Biologists' Smoker was held under the joint sponsorship of the Society of Systematic Zoology and the Association, Monday evening, Dec. 29, from 9 P.M. till midnight, in the Exhibition Hall of the Kiel Auditorium. The starting hour was fixed so as to permit attendance at the Sigma Xi address, the National Geographic lecture, the various dinners, and other evening sessions. About 2000 enjoyed the opportunity to renew contacts with their colleagues. Cigarettes were provided through the courtesy of Philip Morris, and the refreshments included beer, Coca-Cola, and several of the products of the National Biscuit Company. The Association acknowledges with much appreciation these generous contributions.

AAAS Science Theatre. Beginning Saturday afternoon, Dec. 27, six programs, each four hours long, showed 37 of the latest foreign and domestic scientific films, chosen for their variety of subject matter and other qualities. Nearly all were in color, with sound, and nearly all were 1952 releases. By a special arrangement, the film *Oak Wilt in Wisconsin* was narrated in person by A. J. Riker, of the University of Wisconsin. *Experimental Film on Air Blast Control of Gasoline Spillage Fires,* produced by Parks College of Saint Louis University, was also narrated. The Association again expresses its appreciation to those who so kindly lent such excellent films.

Local public information. A report on public information at St. Louis will be found elsewhere, but the appreciation of the Association to Howard A. Marple, director, Advertising and Public Relations, Monsanto Chemical Company, and to the members of his Subcommittee on Local Public Information for their effective work in publicizing the meeting in the Greater St. Louis area may appropriately be recorded here.

The St. Louis Reception Committee. The Preconvention Issue of SCIENCE (116, 611 [1952]) listed all those who

served on the Executive Committee and the several subcommittees of the St. Louis Reception Committee, and who, in one way or another, contributed to the success of the convention. The Association was fortunate in having as general chairman, Charles Allen Thomas, president of the Monsanto Chemical Company. He maintained an interest in all phases of the meeting and welcomed the Association to St. Louis upon the occasion of the AAAS Presidential Address of Kirtley F. Mather. To Dr. Thomas and his executive assistant, Philip R. Tarr, the Association is greatly indebted.

Annual Exposition of Science and Industry. The Annual Exposition of Science and Industry is well established as an integral and important feature of the annual meeting of the Association. As its title implies, it provides those who use the tools and materials of science and those who produce and distribute them an opportunity to meet each other. The 1952 Exposition, with 72 exhibitors and 116 booths, which filled Convention Hall of the Kiel Auditorium and overflowed into the promenade, did not fall short of the high standard of recent years. In addition to the latest and best in scientific books, instruments, and laboratory supplies, there were excellent special exhibits and a splendid series of technical exhibits of large industrial firms—which are coming to realize the advantages of showing their latest technological accomplishments to an appreciative, highly trained, professional attendance.

Potential exhibitors in the St. Louis area were approached through a vice-chairman of the St. Louis Reception Committee, and the Association is conscious of its obligation to Leslie J. Buchan, vice chancellor and dean of the faculties, Washington University, for his personal efforts and keen interest throughout. In addition to the exhibitors listed on pages 619–25 of the December 5, 1952, issue of SCIENCE, the following had booths:

Anheuser-Busch, Inc.
Denoyer-Geppert Company
Folkways Records & Service Co.
General Van & Storage Company, White Motor Company, and Fruehauf Trailer Co.
Hospital Topics and *Northwest Medicine*
E. Leitz, Inc.
Ludlow Saylor Wire Company
McDonnell Aircraft Corporation
Missouri Bureau of Public Health Engineering
Natkin & Company, Inc.
Nuclear Research & Development, Inc.
Phillips Scientific Corporation
Westinghouse Electric Corporation

Booth space was endowed by:

Nooter Corporation
Olin Industries, Inc.
Southwestern Bell Telephone Company
The Technicon Company
Union Electric Company of Missouri

Reports of Sections and Societies[1]

American Mathematical Society (A1)

The American Mathematical Society held its 59th annual meeting in conjunction with the AAAS in St. Louis. All sessions were held on the campus of Washington University. There were approximately 80 contributed papers. Marston Morse, of the Institute for Advanced Study, gave the Josiah Willard Gibbs Lecture, entitled "Topology and Geometrical Analysis," and John von Neumann, also of the institute, gave his retiring presidential address, entitled "A Logical Theory of Automata." At a joint session with Section A of the AAAS, R. L. Wilder, of the University of Michigan, gave a retiring vice-presidential address on "Origin and Growth of Mathematical Concepts." A. M. Gleason, of Harvard University, gave an invited address entitled "Natural Coordinate Systems," which was awarded the Newcomb Cleveland $1000 prize for the outstanding paper presented at the AAAS meetings.

At the annual business meeting, D. H. Lehmer was elected vice president, and the following were elected to the council of the society: F. B. Jones, E. E. Moise, B. J. Pettis, R. M. Thrall, and G. W. Whitehead.

E. G. BEGLE, *Secretary*

Association for Symbolic Logic (A2)

The annual meeting of the Association for Symbolic Logic was held at Washington University on Dec. 29. There were morning and afternoon sessions for contributed papers, and during the morning session J. Barkley Rosser gave his retiring presidential address on "Many-valued Logics."

Atwell R. Turquette presided at this meeting, at which, in addition to Professor Rosser's address, the following papers were presented: Alan Ross Anderson, "Improved Decision Procedures for Lewis's Calculus S4 and von Wright's Calculus M;" William T. Parry, "A New Symbolism for the Propositional Calculus;" and Alfred Tarski, "Some Metalogical Results Concerning the Calculus of Relations." Papers by Alfred Tarski on "A Formalization of Set Theory Without Variables," and "An Undecidable System of Sentential Calculus," and by Alan Ross Anderson on "A Consistent Extension of Fitch's *Symbolic Logic*," were read by title.

At the afternoon session, J. Barkley Rosser presided, and the following papers were presented: S. C. Kleene, "Arithmetical Predicates and Function Quantifiers;" John R. Myhill, "A Stumblingblock in Constructive Mathematics;" Robert L. Stanley, "Simplified Foundations for Mathematical Logic;" John R. Myhill, "On the Logical Paradoxes" (by title); and Hao Wang, "Predicative Foundations of Mathematics" (by title).

At the council meeting, the following elections were announced—each for a period of three years: W. V. Quine, president; Leon Henkin, vice-president; A. Robinson and J. C. Cooley, members of the Executive Committee; Robert Feys and Paulette Destouches-Fevrier, members of the council. Stephen C. Kleene was named for another three-year term as editor of the *Journal of Symbolic Logic.*

The next annual meeting of the association will be held

[1] Key symbols correspond to those in the General Program.

in conjunction with the meetings of the American Philosophical Association, Dec. 28–30.

JOSHUA BARLAZ, *Secretary*

Mathematical Association of America (A3)

The 36th annual meeting of the Mathematical Association of America was held at Washington University on Tuesday, Dec. 30. About 500 persons were registered, including 281 members of the association. The following scientific program was presented: "The Mathematical Work of Jacques Hadamard," by Szolem Mandelbrojt, Rice Institute and Collège de France; "Recent Applications of Convex Functions," by J. W. Green, UCLA (presented by title); "The Scientific Research Program of the Office of Ordnance Research," by A. H. Diamond, U. S. Army; and "Mathematics and the Educational Octopus," by S. S. Cairns, University of Illinois.

A symposium on The Teaching of Service Courses in Mathematics included papers on "Engineering Mathematics at Mid-Century," by S. H. Caldwell, Electrical Engineering, MIT; "What Shall We Teach in Service Courses?" by F. E. Hohn, University of Illinois; "Mathematics for Physicists, Pure or Applied?" by J. W. Buchta, University of Minnesota; and "Abstract Mathematics for Scientists," by W. L. Duren, Jr., Tulane University and the National Science Foundation.

At its business meeting, the following officers were elected: president: E. J. McShane, University of Virginia, for a two-year term; second vice president: W. L. Duren, Tulane University, for a two-year term; members of the Board of Governors: S. S. Cairns, and A. W. Tucker, Princeton University, for a three-year term. Continuing in office from last year are First Vice-President F. L. Griffin, of Wesleyan University, and Secretary-Treasurer H. M. Gehman, of the University of Buffalo.

The thirty-fourth summer meeting of the association will be held Aug. 31–Sept. 1 at Queen's University and the Royal Military College, Kingston, Ontario, in conjunction with meetings of the American Mathematical Society and the Canadian Mathematical Congress. At this meeting P. R. Halmos, of the University of Chicago, will deliver the second series of Earle Raymond Hedrick Lectures on "Axiomatic Set Theory."

HARRY M. GEHMAN, *Secretary-Treasurer*

Section on Physics (B)

On Monday, Dec. 29, Section B cosponsored two interesting sessions that were arranged by Ralph Overman, of the Oak Ridge Institute of Nuclear Studies—one on "Nuclear Science in Industry" and one on "Research Applications of Carbon 14." (These are reported under B2.)

Monday evening, at a Physicists' Dinner sponsored jointly by Section B and Sigma Pi Sigma, Edward O. Hulburt, chairman of Section B, was the toastmaster, and Arthur H. Compton, retiring chairman, gave a stimulating address on "The Human Value of Physical Science." Dr. Compton discussed the rapid progress of science as the basis of the economic and military strength of the nation. He emphasized that continued growth is essential to this strength and that the greatest possible freedom for international exchange of scientists and scientific ideas is an important factor in scientific progress.

At the Tuesday morning symposium on Magnetic Resonance, arranged by Arthur L. Hughes, of the Physics Department, Washington University, the speakers were G. E. Pake, J. Townsend, S. T. Weissman, and B. Commoner, of Washington University; L. H. Meyer, of the University of Illinois; and G. M. Temmer, National Bureau of Standards. Dr. Pake opened the symposium with a discussion of the basic principles of magnetic resonance and how it can be used to give information about the magnetic moments of nuclei and unpaired electrons and molecules. Magnetic resonance offers a new approach to the solution of many problems in molecular structure. Dr. Townsend discussed instrumentation in magnetic resonance and how technical problems in this field are met and solved. Dr. Weissman described experiments on free radical molecules. These are chemical "freaks" in that they have, contrary to most molecules, an odd number of electrons. Magnetic resonance gives information as to the location of the unpaired electron in the free radical molecule. Dr. Meyer described methods employing magnetic resonance to determine certain structural details of molecules. Dr. Commoner reported on the progress made in applying magnetic resonance as a new technique to observe free radicals in living systems. Dr. Temmer gave an account of a proposed experiment whereby the magnetic moments of radioactive nuclei could be determined by magnetic resonance experiments at very low temperatures.

Section B was also cosponsor of a general session for invited papers on geophysics arranged by Ross R. Heinrich, Saint Louis University, and a Symposium on Tornadoes and Tornado Forecasting, arranged by Edward M. Brooks, Saint Louis University.

At a meeting of the AAAS Council George R. Harrison, MIT, was elected a vice president of AAAS and chairman of Section B for 1953. Gladys Anslow, of Smith College, has been elected a member of the Section Committee for a four-year term.

FRED L. MOHLER, *Secretary*

Oak Ridge Institute of Nuclear Studies (B2)

The one-day program of the Oak Ridge Institute of Nuclear Studies consisted of two parts. The morning session, "Nuclear Science in Industry," was presided over by William L. Davidson, director of the AEC office of Industrial Development. Papers were given by Irving P. Orens, professor of physics and chairman of the Graduate Division, Newark College of Engineering, on "Industrial Applications of Radioisotopes;" H. R. Spedden, head of the Minerals Research Department, Union Carbide and Carbon Corporation Research Laboratories at Niagara Falls, on "Radioisotopes in Metallurgy;" John Grebe, research counselor, Dow Chemical Company, on "Problems of Industrial Nuclear Power;" C. Rogers McCullough, director of the Atomic Electric Project of Monsanto Chemical Company, Union Electric Company, and the AEC, on "Nuclear Power for Industry;" and William L. Davidson, "Industrial Participation in the Nuclear Programs of the AEC."

The afternoon session, "Research Applications of Carbon 14," was presided over by Paul C. Aebersold, chief of the AEC Isotopes Division. Presentations were given by Laurence J. Kulp, Lamont Geological Observatory, Columbia University, on "Radiocarbon Dating;" John G. Burr, Organic Chemistry Section, Oak Ridge National Laboratory, on "The Use of Carbon 14 in the Determination of Reaction Mechanisms in Organic Chemistry;" Sidney Udenfriend, National Heart Institute, National Institutes of Health, on "Problems in the Use of Carbon 14 in Biochemistry;" and S. Aronoff, Insti-

tute for Atomic Research and the Department of Botany, Iowa State College, on "Applications of Carbon 14 to Plant Physiological Chemistry and Studies in Photosynthesis."

The institute was joined in presenting the program by Section B, Section M, and Section P of the AAAS as cosponsors.

In addition to the morning and afternoon sessions of the program, a luncheon was given at the Jefferson Hotel for the speakers, former participants in the training courses given by the Institute Special Training Division, and others who attended the meeting.

RALPH T. OVERMAN, *Program Chairman*

Section on Chemistry (C)

A Christmas bonus in the form of 70 good previews of the chemistry of tomorrow was enjoyed by all who attended the program of Section C at St. Louis. Symposia, with both competent moderators and capable speakers, covered topics such as The New Synthetic Fibers, Contributions of Chemistry in the Field of Human and Animal Nutrition, Contributions of Chemistry to Medicine, Chemistry and Dentistry Team up for Progress, Contributions of Chemistry to the Cancer Problem, Liquid Fuel Supplies of the Future and the Impact on the Chemical Industry by Chemicals Available as Coproducts from Synthetic Fuel Processes, and Contributions of Chemistry to Agriculture.

The symposia were arranged and moderated by such scientists as Barbara K. Campbell, Kenneth N. Campbell, L. L. Hirst, Frances Krasnow, Barrett L. Scallet, Lloyd V. Sherwood, and Frank J. Soday. Speakers on the several programs came from widely scattered geographic points —for example, John R. Whinfield, Imperial Chemical Industries, Ltd., Hertfordshire, England, and Sofronio Balce, Araneta Institute of Agriculture, Malabang, Rizal, P. I. Variety was obtained in the program at Washington University with papers presented by former graduates of the institution and with the dedication of Louderman Hall marking the centennial of the university.

The dinner meeting of Section C was well attended, and an address on "The Impact of Chemistry on the Advancement of Science" was given by Carroll A. Hochwalt, chairman of Section C and vice president of Monsanto Chemical Company.

Whether or not you were present in St. Louis, now is the time to plan for the Boston meeting of Section C, to be held during the closing week of 1953. It is not too early to start on the preparation of the paper you may wish to present at the submitted papers session in Boston.

ED. F. DEGERING, *Secretary*

Section on Astronomy (D)

The program of Section D, held at the Hotel Jefferson on Dec. 29, consisted of six professional and three amateur papers, followed by a short round-table discussion of the "Contributions of the Amateur to the Advancement of Astronomy." The address of the retiring vice president and chairman of Section D, Harold L. Alden, was given at the end of the afternoon session. Approximately 40 people heard his talk on "Our Stellar Neighbors."

FRANK K. EDMONDSON, *Secretary*

Astronomical League (D1)

The Astronomical League participated actively in the sessions of Section D, and especially in the round-table discussion on "Contributions of the Amateur Astronomer to the Advancement of Astronomy," arranged by Russell C. Maag. Papers were presented by Rolland R. La Pelle on "The Amateur in Astronomy," by David Rosebrugh on "Activities of the American Association of Variable Star Observers," and by R. C. Maag and Grace Scholz on "Future Plans and Activities of the Astronomical League."

RUSSELL C. MAAG, *Program Chairman*

Section on Geology and Geography (E)

The sessions of Section E were held at Kiel Municipal Auditorium and Wilson Hall, Washington University, Dec. 29 and 30. Approximately 150 individuals participated. The program included: a symposium on Modern Research of State Geological Surveys and its Economic Values, 2 sessions, 6 papers, 6 planned discussions; General Geology: Stratigraphy and Sedimentology, 1 session, 10 papers; General Geology: Pleistocene and Physical Geology, 1 session, 11 papers; Geography Panel, "Impact of the Missouri Basin Program," 1 session, 4 papers; Section E Smoker; and the vice-presidential address by George W. White. The State Geological Survey program was organized by M. M. Leighton and was appropriate to the Association theme, "The Common Ground of Science, Engineering, and Industry." H. H. McCarty organized the geography panel. The vice-presidential address and smoker were held at Washington University, where the Department of Geology acted as host. Arrangements were made by Carl Tolman, and about 75 attended.

The following officers were elected for 1953: vice president and chairman, Wilmot H. Bradley; retiring vice president, A. C. Trowbridge; and elected section committee member, Carl Tolman.

LELAND HORBERG, *Secretary*

National Geographic Society (E2)

The National Geographic Society lecture in the Kiel Auditorium on Monday, Dec. 29, was in all respects a successful affair, with 3100 present to hear the lecture of W. Robert Moore on Nigeria and the Sudan. Special interest centered on the portion of the lecture pertaining to the eclipse observation in Khartoum. Kirtley F. Mather greatly strengthened the program with his gracious introduction of the speaker.

From the point of view of the society's exhibit I was also satisfied. The results slightly surpassed last year's, as a matter of fact.

My colleagues and I found everyone with whom we had to do convention business very cooperative and friendly.

RALPH GRAY, *Editorial Staff*

National Speleological Society (E3)

At the meeting of the National Speleological Society Charles E. Mohr, president, gave the first paper, on cave animals of the Ozarks with particular reference to Marvel Cave near Branson, Mo. Reference was made to the unpigmented crayfish, salamanders, fish, and planaria, and President Mohr pointed out that a distinction must be made between native cave forms and transient animals, that merely use the cave for shelter. The number of bats found in Marvel Cave has been greatly reduced in recent years as a result of the collecting activities of an animal dealer. This affects other organisms, because the smaller cave animals, such as isopods and planaria, abound where the water flows over deposits of bat guano, and certain

molds grow on the feces of bats. Algae and liverworts are found wherever light can enter, even though for only a small length of time daily.

Jacob A. Rinker, professor of mathematics at Eureka College, Illinois, demonstrated methods used in surveying Marvel Cave. The first room measures 250 feet high and 400 feet long, making it one of the largest in Missouri.

Brother G. Nicholas, of La Salle High School, Cumberland, Md., described the opening of a new portion of the Cumberland Bone Cave, in which large deposits of Pleistocene vertebrate remains have been found. The fossils discovered include 45 species, 28 of which are now extinct. Types represented vary from mastodons to bats, and include such animals as tapirs, peccaries, bears, wolverines, and smaller species. This diversity suggests a gradual accumulation under a succession of climatic conditions. Excavations are continuing, and it is hoped eventually to locate complete skeletons of the species found thus far.

The 1953 annual convention of the National Speleological Society will be held in Louisville, Kentucky, during the third week of April.

BROTHER G. NICHOLAS, *National Speleological Society*

Section on Zoological Sciences (F)

The Section F program consisted of a number of cosponsored symposia, panel discussions of books, and sessions for contributed papers dealing with physiology, general biology and behavior, and embryology and anatomy.

The panel discussions of selected texts, sponsored by the Society of Systematic Zoology and successfully carried out for the first time, proved to be of especial interest to those in attendance at the meeting, as well as to the general public, as evidenced by near-capacity audiences. This new adventure in the zoological programs adapted from TV proved to be both worth while and attractive, as judged by the favorable responses received from all who participated.

At the annual business meeting of the section several matters of interest to the members were discussed. Affiliated organizations and societies were urged to qualify all eligible members for the rank of Fellow in the AAAS. Many more members are eminently worthy of this honor than have ever been nominated for it.

The biologists' smoker, held in the convention hall of Kiel Auditorium was the pleasant and well-attended event that it always is. The zoologists' dinner, breaking with tradition, was held in the very attractive and unique Bevo Mill. "Applied Systematics," the address of Waldo L. Schmitt, retiring chairman of the section, concluded the evening's program.

J. H. BODINE, *Secretary*

Herpetologists League (F1)

Only eleven persons attended the Conference on Common Names, but all were enthusiastically and unhesitatingly cooperative and helpful in furthering progress toward stabilization of common names. They carefully considered the aims and objectives the project should have, the principles of name selection, and (with the privilege of examination at their leisure for 5 days) the actual names so far approved unanimously by the members of the committee who expressed their opinions.

The course of action for the future was unanimously approved, with a request for submission to the annual meeting in Boston in 1953 of new materials approved in the interim by the Committee on Common Names.

HOBART M. SMITH, *President*

Society of Systematic Zoology (F2)

The fifth annual meeting of the Society of Systematic Zoology was by far the most elaborate and extensive in its brief history. Not only did its sessions include the customary kinds—symposia, addresses, paper-reading sessions, a smoker, and a dinner—but also a special program of informal anecdotal talks, a motion picture, and four meet-the-author type of book-discussion panels. The latter were unprecedented in such meetings. Attendance was unusually high, the special features drawing 100–200 persons.

Officers for 1953 are: president, H. B. Hungerford, of Lawrence, Kan., by automatic succession; president-elect, H. W. Stunkard, of New York; secretary-treasurer, R. E. Blackwelder, of Washington, D. C. (serving the second year of a two-year term); and new councillors, Hobart M. Smith, of Urbana, Ill., and J. Speed Rogers, of Ann Arbor, Mich.

It was decided to hold the 1953 meeting in Boston with the AAAS at Christmastime and similarly, the 1954 meeting in Berkeley. The newly established Pacific Section will probably act as host at the latter meeting.

An ideal arrangement of the society's headquarters lounge and book exhibit was reflected in their popularity and constant use. The exhibit, the property of the society, was much larger than heretofore, including 342 commercial zoological books of 56 publishers, and many monographs and journals. A 48-page mimeographed list of the books was available to all who desired it, and several hundred were distributed.

Membership in the SSZ continues to climb steadily. It has now passed 1200, maintaining the 200-per-year increase since its founding. Subscriptions to the journal *Systematic Zoology* have passed 800 in its first year.

The successful symposium on The Relation of Life History Studies to Systematics included talks by H. W. Stunkard on parasitic worms, by Grace Orton on fishes and amphibians, and by C. D. Michener on insects. It is expected that these papers will be published in *Systematic Zoology*.

The Sunday afternoon session on famous zoologists was unusually interesting and entertaining. The talks were informal and anecdotal, giving personal glimpses of five famous zoologists and also of the speakers. Because of his doctor's orders, H. A. Pilsbry was not able to attend, but his remarks on Charles Darwin as a barnacle specialist were read by the secretary. F. G. Brooks spoke on Charles Wardell Stiles; A. S. Romer, on E. D. Cope and O. C. Marsh; C. L. Hubbs, on David Starr Jordan; and Alexander Petrunkevitch, who presided at the session, spoke on August Weismann. It is hoped that this fascinating program can be published as a unit.

Two of the book panels discussed recent books on evolution. The first dealt with *Time's Arrow and Evolution*, by H. F. Blum, with the author and four discussants: G. G. Simpson, Wendell Latimer, Edgar Anderson, and U. N. Lanham. The second panel discussed *The Meaning of Evolution*, by G. G. Simpson, with the author and four discussants: H. F. Blum, G. L. Jepson, E. T. Smith, and T. C. Schneirla.

Two other book panels were concerned with biology and zoology textbooks. In each, three textbooks were discussed as examples of three approaches—in biology, principles, systematic, and humanistic; and in zoology, principles, systematic, and ecological. Keen interest was displayed in these sessions.

The motion picture *The New Frontier* was a beautiful record in full color of life in the depths of the sea and

of the operation of the marine laboratory ship of the Hancock Foundation at the University of Southern California. It was narrated by John S. Garth.

R. E. BLACKWELDER, *Secretary*

The National Association of Biology Teachers (FG4)

The 15th annual meeting of the society was devoted to practical problems of biology teaching, reports on the status of health education in the high schools, reports of the various Conservation Education Committees working in all parts of the country under project leader R. L. Weaver, a field trip, and exhibits by high school pupils of experimental and museum work. The session held jointly with the National Association for Research in Science Teaching was devoted to content of general science courses, training and professional opportunities for women in the natural sciences, use of visual aids, and biology clubs. Among many papers stimulating wide interest may be mentioned "Flightless Birds of New Zealand, Extinct and Near-Extinct" (Katherine V. W. Palmer), and "College Science Teaching: Its Present Status and its Improvement" (Harry J. Fuller).

On Sunday 135 members participated in a joint field trip with the American Nature Study Society to the Mississippi and Missouri river flood plains and to the August A. Busch Wildlife Area.

At the luncheon of the society E. C. Stakman delivered an address, generally acclaimed as a masterpiece, on "The Need for Depth of Insight and Breadth of Vision in Biology." Three meetings were held jointly with the American Nature Study Society and the National Association of Science Teachers. The joint buffet supper with these societies on Saturday night was followed by a report by Roger Tory Peterson, of the American Nature Study Society, on his recent study in Europe, illustrated with superb motion pictures of European bird life.

One business session was given over to the Editorial Board of the *American Biology Teacher*. The journal is undergoing improvements in a number of its departments and has appeared with a new attractive cover. The modernized journal will stand as a monument to the many years of untiring effort of the editor-in-chief, John Breukelman, whose retirement from this post, effective in October, was accepted with reluctance on the part of the Executive Board. The assistant editor, B. Bernarr Vance, was named his successor, and Muriel Beuschlein continues as managing editor.

Officers for 1953 are: Leo F. Hadsall, president; John J. Harrold, secretary-treasurer; Lydia Elzey, first vice president; Brother H. Charles; second vice president.

HARVEY E. STORK, *President*

Phi Sigma, National Biological Honorary Society (FG5)

Biennially, delegates from some 30 active chapters of Phi Sigma convene in a national meeting to chart the future of this organization. The past tradition of joining the AAAS was revived this year.

Most attention was directed to the development of means for stimulating research interest in young scholars. Toward this end, elaboration of the current system of scholarship awards was planned, and expansion and strengthening of the society were implemented.

The following officers were elected to the council to serve four-year terms: Fred Orcutt, Virginia Polytechnic Institute, executive secretary; and Karl F. Lagler, University of Michigan, chancellor. The next meeting is set for 1954, place undecided. Institutions awarding graduate degrees in biological sciences are invited to communicate with the secretary for representation of Phi Sigma and/or its awards on their campuses.

Resolutions were adopted to convey to Harley J. van Cleave best wishes for speedy recovery of good health, and to the AAAS for effective meeting arrangements. (Regrettably, Dr. van Cleave passed away in Urbana on Jan. 2, 1953.)

KARL F. LAGLER, *National Chancellor*

Section on Botanical Sciences (G)

Section G held a four-day program at St. Louis with ten sessions. Except for two sessions at the Museum Building of the Missouri Botanical Garden and the dinner meeting at the Hotel Statler, all meetings were held at the Kiel Auditorium. Seven sessions were devoted to symposia, two to contributed papers, and one to the address of Vice President Lincoln Constance, of the University of California, who spoke on "The Role of Plant Ecology in Biosystematics" to the 75 persons who had assembled for the All-Botanists dinner. Also at the dinner, the Mary Soper Pope medal was awarded to E. Lucy Braun, professor emeritus at the University of Cincinnati, for her outstanding contribution to forest ecology. The medal, which is given by the Cranbrook Institute of Science, was presented by M. Trufant Hall, Cranbrook botanist, and Pierre Dansereau, chairman of the Medal Committee for 1952.

The five symposia that formed the bulk of the Section G program were as follows: "The Improvement in Teaching of Taxonomy," arranged by Aaron J. Sharp, University of Tennessee; "Biosystematics and Taxonomic Units," arranged by Edgar Anderson, Missouri Botanical Garden; "Metabolism in the Green Plant," arranged by Barry Commoner, Washington University; "The Western Range—Our Great National Resource," arranged by F. W. Albertson, Fort Hays Kansas State College, and David F. Costello, Rocky Mountain Forest and Range Experiment Station; and "Plant Sociology and the Taxonomy of Vegetational Units," arranged by the section secretary.

The two sessions provided for contributed papers had 15 speakers representing ten different states, with attendance ranging from about 50 to 70 persons. During recent years, when the botanical societies have held their official annual meetings at times other than the meetings of the AAAS, Section G has consistently scheduled as many sessions for contributed papers as the demand calls for. The section secretary is convinced that this is a necessary and useful function of the AAAS and, furthermore, that it is a means of providing adequate audiences for the symposia. No matter how worth while the symposia are, many persons who would like to hear them cannot attend AAAS meetings unless they can get some financial subsidy, which is usually contingent upon the presentation of a paper. Although it may be agreed that one of the very valuable functions of the AAAS is to organize the specialized and interdisciplinary symposia, it is urged that the sessions for contributed papers also be facilitated. With the two program-sponsoring organizations meeting at different times of the year and in different sections of the country, they can both help serve the needs of American botanists in this way. It is hoped that, for the benefit of botany and botanists in general, some of the botanical societies will find it desirable to meet, at least at times, officially with the AAAS. Two annual meetings a year may be too much for some societies, in which

case they could consider alternating their official meetings between the AIBS and the AAAS. The present situation does not provide a satisfactory solution of the needs of botanists for national meetings.

Attendance at the seven symposia of Section G was gratifying. It varied from a minimum of about 80 to a maximum of 100, and averaging about 100. During the four days of the program there was only one conflict, when the second session of the symposium on Metabolism in the Green Plant was scheduled concurrently with that on The Western Range. At large meetings multiple conflicts are the rule, and individual sessions are commonly less well attended than were the recent ones at St. Louis. Altogether about 50 botanical papers were presented. Official program participants represented 35 different institutions and came from 22 states and Canada. They came from the East (Connecticut, New York, and New Jersey), the South (North Carolina, Tennessee, Texas, and Louisiana), and the West (Colorado, California), as well as from the Middle West. It was truly a national meeting.

Some sessions of the Section G program were cosponsored by the Ecological Society of America, the Illinois Section of the American Society of Plant Physiologists, the American Society of Naturalists, and the Grassland Research Foundation. It is hoped that other interested organizations will arrange to cosponsor programs in the future, or will take the initiative in developing programs that Section G can cosponsor.

Comments that have come to the secretary indicate that the meetings at St. Louis were the most successful of recent years. We look forward confidently to even more successful meetings at Boston in 1953 and at Berkeley in 1954.

STANLEY A. CAIN, *Secretary*

Section on Anthropology (H)

The 1952 annual meeting of section H consisted of nine sessions, of which four were held jointly with Section K. Excluding the latter, 33 persons participated. A symposium organized by James B. Watson, Department of Sociology and Anthropology of Washington University, on The Rio Grande Pueblos and the Plains occupied two sessions and set the theme for the meetings. From an attack on this problem, which involved ethnology, ethnohistory, folklore, musicology, physical anthropology, and, above all, archaeology, it was agreed that the two areas of indigenous cultures under consideration have left numerous evidences of contacts at different times and at numerous places along and beyond the boundaries between them. The central problem of the symposium was not whether the peoples occupying the Plains and Pueblo areas exchanged cultural traits, but rather when, where, and how. A round-table discussion of the relative chronology of Plains and Southwestern archaeology was added to the program to deal specifically with the first of these questions.

The contributed papers in archaeology continued the same theme, for they dealt with the regions surrounding the Plains-Pueblo area: the Mississippi Valley and Northern Mexico. Frank H. H. Roberts' beautifully illustrated vice-presidential address, "Progress in the Archaeological Salvage Program," dealt with the emergency excavation of river basin sites that are about to be flooded by dam construction. As these sites cover many areas and various periods, his talk also demonstrated the trend toward a unified American archaeology.

Among the contributed papers in social anthropology, several dealt with questions of acculturation, a theme carried over from 1951. A symposium on cultural relativity held at Philadelphia also served as the focus for an attack on the application of this concept by Frank Hartung, of Wayne University. Still another evidence of the impact of the 1951 meeting was a report by Richard K. Beardsley, of the University of Michigan, concerning the organization of a committee on Old World archaeology and prehistory, which grew out of the symposia on Old World and New World studies which Lauriston Ward organized a year ago. The committee is planning a society that will stimulate inter-area and interdisciplinary studies of Old World prehistory through the publication of bibliographies and other activities.

The joint sessions consisted of symposia on Regional Research: Emerging Concepts and Techniques and Social and Economic Aspects of Technical Assistance Programs.

A special additional feature of the meetings enjoyed by the members of the section and visiting anthropologists was an informal evening and supper at the home of Dr. and Mrs. P. H. Titterington. The generous hospitality and the opportunity to see Dr. Titterington's archaeological collections were greatly appreciated.

Plans are already under way for the December 1953 meetings in Boston. Besides sessions for archaeologists, who contributed the majority of papers at the St. Louis meetings, it is hoped to have a better representation of contributions from other fields of anthropology. Clyde Kluckhohn will give the vice-presidential address, and it is anticipated that there will be more sessions for social anthropology. Also being arranged is a symposium dealing with the nonhuman primates and the contribution made by their study (sociological, psychological, physiological, ontological, and anatomical) to an understanding of human origins.

GABRIEL LASKER, *Secretary*

Section on Psychology (I)

The annual meeting of Section I in St. Louis consisted of five sessions of submitted papers, with two sessions devoted to clinical, and a session each to training, theoretical, and experimental psychology. In addition, Section I cosponsored with the sections on Medicine, Engineering, and Industrial Science a symposium on Men and Machines. The program was arranged by Philip H. DuBois. William A. Hunt presided at the morning session and Paul M. Fitts at the afternoon session. The vice-presidential address was delivered by Harold Schlosberg on the topic "The Intensive Dimension of Emotion."

The following officers were elected for the coming year: vice president, Frank Beach; secretary, Dewey Neff; committee member, Clarence Graham.

DELOS D. WICKENS, *Secretary*

Section on the Social Sciences (K)

Most of the Section K program this year was devoted to joint activities with other groups. Four sessions had been arranged with Section O on the subject of combined resources development, with special reference to the Missouri Valley, an area of major concern in St. Louis. In these sessions, the problems of economic development were considered from the standpoint of basic resources, including soils, vegetation, minerals, and water, as well as from the organization of these resources, as in agriculture or in industrial development. Problems of investment and government relations in combined resources development of a large area were also discussed.

A unique feature of these sessions was the provision of a full two-hour period for discussion of the papers that had been presented.

In cooperation with Section H, a series of three sessions was devoted to an examination of the social and economic aspects of the technical assistance programs. In the first, two representatives from countries receiving technical assistance presented an analysis of what is desired from such assistance and stressed the attitudes of these countries that were favorable or unfavorable to programs of economic development. They placed much emphasis also on the characteristics of the technicians who go out on technical assistance assignments. A second program discussed the social and economic problems encountered from the standpoint of the administrators, and in the third session there was a detailed analysis of social and cultural factors that must be taken into account whenever a program for economic development is in operation.

In cooperation with the National Academy of Economics and Political Science and Section P, a session was arranged to consider the applications to economic and industrial problems of modern information processing devices, particularly electronic computers. Other sessions dealt with emerging concepts and techniques in regional research, the role of the humanities and the social sciences in medical education, and the role and responsibilities of the individual scientist in today's world.

Lowry Nelson was nominated as chairman of the section, and Amos Taylor was elected to a four-year term on the section committee.

CONRAD TAEUBER, *Secretary*

National Academy of Economics and Political Science (K1)

The National Academy of Economics and Political Science held two forum meetings in 1952, one in Washington, D. C., on the general subject of "Eastern Problems of the Western Democracies," and the other in St. Louis, at the 119th Annual Meeting of the AAAS, on the general topic of "Information Processing in Social and Industrial Research." Collaborating at both session meetings were Section K and the National Social Science Honor Society, Pi Gamma Mu (and Section P, at the St. Louis session).

Amos E. Taylor, director of the Department of Economic and Social Affairs, Organization of American States, was elected to the office of third vice-chairman of the board at the annual board meeting held in January 1952. Dudley Dillard, professor of economics, University of Maryland, and Howard B. Myers, director of research, Committee for Economic Development, were elected new members of the Board of Directors. Francis O. Wilcox, staff director, U. S. Senate Committee on Foreign Relations and member of the Executive Council of the American Political Science Association, was elected as a new member of the Advisory Council.

The thirty-first annual sessions of the Academy will be held at the Brookings Institution in Washington, D. C., the first week in May 1953. The general subject for development, which will concern a current important problem in the field of economics, political science, or foreign affairs, will be announced at a later date. The proceedings of these sessions will be published in the Autumn 1953 issue of *Social Science*—the official journal of the National Academy and of the National Social Science Honor Society, Pi Gamma Mu. Proceedings of the thirtieth annual sessions, held May 7–8, 1952, in Washington, D. C., and referred to above, comprised the Autumn 1952 issue of *Social Science*.

DONALD P. RAY, *Executive Secretary*

Section on the History and Philosophy of Science (L)

The unusual symposium on "Relations between Science and Thomistic Philosophy" was attended by more than 150 persons; it ended in an animated discussion. Conway Zirkle, vice-president for Section L, called it, "one of the best symposia I ever attended." The participants were Robert J. Henle, S.J., and George Peter Klubertanz, S.J., St. Louis University; Yves Simon, University of Chicago, and Hugh S. Taylor, Princeton University. In his remarks on "One Scientist's Attitude to Thomistic Philosophy," Professor Taylor stated:

> The modern scientist is asking entirely different questions from those asked by the Scholastic philosophers since St. Thomas Aquinas' time in the 13th century. . . . We need to insist on an increased appreciation of our students of science of points of view other than that of the inductive sciences. . . . What I think the Scholastic philosophers are trying to tell the scientists is what Aquinas wrote: "The order of Nature is not the order of Thought." They are trying to tell us that science, in spite of all its manifold contributions to the health, welfare and development of human life, does not and cannot provide us with a philosophy, a way of life.

Leonardo da Vinci's birth 500 years ago was commemorated by a symposium on his scientific, artistic, and curatorial achievements. Raymond S. Stites, curator in charge of educational work at the National Gallery of Art, discussed Leonardo's personality; using some 40 pages from Leonardo's manuscripts, he demonstrated that this unique man functioned simultaneously as a scientist and an artist from his earliest creative years—contrary to the opinions of most biographers. Chauncey D. Leake, former president of Section L, stressed the remarkable scope of Leonardo's scientific achievements. He called particular attention to Leonardo's work in botany: to the discovery of the tree-ring method of dating and to the flow of sap within plants. William Suida, author of the definitive work *Leonardo and Seine Kreise*, and now the historian for the Samuel H. Kress Foundation, pointed out that only five extant works of Leonardo are in any way documented, although 15 or 16 others are generally accepted on the fairly firm basis of their style alone. Four of these are in the U. S.; one, the exquisite *Madonna with the Pomegranate*, has been bought recently by the Kress Foundation for eventual deposit at the National Gallery of Art.

A stimulating session was jointly sponsored by Section M; it dealt with "Methodology of Engineering Research." The participants were Clarence E. Davies, presiding; Earl P. Stevenson, of Arthur D. Little, Inc.; Paul S. Olmstead, Bell Telephone Laboratories; and Morrough P. O'Brien, University of California. A thought-provoking session was held jointly with the Philosophy of Science Association on "Philosophical Problems of Contemporary Biology."

Most of the sessions, including the vice-presidential address, were attended by 40–50 people, but one of the best had only 15 present. Future plans of Section L call

for a determined effort to schedule meetings so that the large number of scientists having the history and philosophy of science as a secondary interest may have the opportunity to share in these programs.

RAYMOND J. SEEGER, *Secretary*

Philosophy of Science Association (L1)

The Philosophy of Science Association, History of Science Association, and Section L of the AAAS met jointly in a one-day session. The two morning papers were both concerned with biology. Heinz Herrmann, of the University of Colorado, presented a very interesting paper on the problem of explanation in biology. He criticized those who have attempted to explain biological phenomena in terms of physical field theory and argued that the biologist is interested in a far more detailed kind of explanation that can be obtained through physical models. A. Bachem, of the University of Illinois, discussed the parallelism of mind and matter, and its relation to biological phenomena.

In the afternoon William A. Werkmeister, of the University of Nebraska, criticized some contemporary attempts on the part of philosophers to arrive at measures of confirmation of scientific hypotheses. Dr. Werkmeister believes that these measures are not possible, and that matters of this sort should rest with the sound judgment of the scientist rather than any measuring devices. Robert A. Bass, of the University of Toledo, discussed the concept of simplicity in science and argued that the scientists have adopted a hypothesis that nature is fundamentally simple, which hypothesis, in Mr. Bass' opinion, seems to have been well confirmed by scientific findings.

C. WEST CHURCHMAN, *Editor*, Philosophy of Science

Section on Engineering (M)

Section M has some 3000 members, all of whom are active members of one or more professional engineering societies. It has associated with it 12 affiliated engineering societies and 5 associated societies. The function of the section is not to compete with the engineering societies but to provide a common platform where engineers, as a group, can meet with scientists in other fields. It is also evident that Section M must receive the active support of its member-societies if it is to function properly, and the year 1952 witnessed a joint effort on the part of the engineering societies to support Section M and to plan its future programs. Six meetings were held in New York City during the year, attended by the Committee of Section M and the secretaries of several engineering societies. The program of the St. Louis Meeting and reorganization plans are the direct results of these meetings. The section plans to continue the meetings of the committee during 1953 and to establish an organization and a program policy for our future activities.

The program for the St. Louis meeting included 17 sessions, in which 72 papers were presented. Cosponsoring groups included the American Industrial Hygiene Association, Central Institute for the Deaf, Veterans Administration, Sections B, I, L, and P, and Subsections Nm and Nd. For the purpose of advertising the annual meeting a committee was organized in St. Louis consisting of representatives of 23 engineering societies, the Engineers Club of St. Louis, St. Louis University, and Washington University. Four thousand programs were printed and mailed to engineers on the mailing lists of the above organizations. The section expresses its thanks to the St. Louis committee for its excellent cooperation.

Officers for 1953 include Clarence E. Davies, chairman, and Frank D. Carvin, secretary, who were both re-elected. Eugene F. Murphy, of the Veterans Administration, New York, was elected section committeeman for a term of four years. Serving on the 1953 Program Committee are Irving P. Orens, chairman, G. Edward Pendray, and E. Lawrence Chandler.

At the annual meeting of the American Society of Mechanical Engineers in New York, Section M cosponsored several meetings of the Applied Mechanics Division of the ASME, and with Section E it cosponsored technical sessions and a program of field trips arranged by the Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers at the Centennial of Engineering at Chicago Sept. 3–6.

FRANK D. CARVIN, *Secretary*

Subsection on Medicine (N1)

During the December sessions of the Association, the Section on Medical Sciences and its subsections, in collaboration with eight other sections (C, F, G, I, K, M, P, and Q) and twelve affiliated societies, sponsored more than 25 symposium programs and panel discussions. These sessions, ranging in content from the problems of teaching in the physiological sciences to air pollution and the psychological adaptation of modern man to his machines, comprised papers and discussions of interest to specialists in all branches of medicine and allied sciences, and stressed the relationships between medicine and the industrial and engineering sciences which it serves and from which it derives support.

Planning for the 1953 meeting has already been started by the new secretary of the subsection, Allan Bass, of Vanderbilt University. The retiring secretary hopes that Dr. Bass will enjoy the same enthusiastic cooperation that we have received during the past four years.

G. K. MOE, *Secretary*

Subsection on Dentistry (N2)

Subsection Nd held three sessions on Dec. 27—morning, afternoon, and evening—with an average attendance of 30 at each session. The first session was devoted to a symposium on the chemistry of the saliva; the second, to scientific contributions to the manufacture of restorative dental materials; and the third to the engineering and chemical factors of water fluoridation.

The Subsection also cosponsored, with Section C, a program on chemistry and dentistry and, with Section M, a program on hearing and speech aids. Members of the subsection passed the following resolution and ordered it to be submitted to the Council of the AAAS:

> Be it resolved that Subsection Nd of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, convened in annual session in St. Louis, December 27, 1952, strongly endorsed the fluoridation of city water supplies as a partial preventive of decay of the teeth of children and recommended that all cities and communities having a central water supply adopt this health measure.

RUSSELL W. BUNTING, *Secretary*

Subsection on Pharmacy (N3)

The subsection on pharmacy (Np) was strengthened during 1952 by the addition of two pharmaceutical organizations—the American Society of Hospital Pharmacists and the American College of Apothecaries, as affiliated societies of the AAAS with representation on

the AAAS Council and on the section committee. At St. Louis the Subsection held four sessions, which were well attended. Over 40 individuals took part in the program, either by contributing original papers or by participating in panel discussions and symposia.

The first symposium considered the problem of accreditation of hospital pharmacies, the establishment of an approved pharmacy internship and residency program, and the possibility of having such accreditation and approval carried out by agencies now in existence, such as the Joint Commission on Accreditation of Hospitals, Schools, and Associations, as well as the hospitals themselves. Participants in the symposium included Martha Johnson, assistant to the director, Joint Commission on Accreditation of Hospitals; James R. Shaw, chief, Division of Hospitals, U. S. Public Health Service; Roy Kneifl, executive secretary, Catholic Hospital Association; L. C. Zopf, secretary, American Association of Colleges of Pharmacy; Grover C. Bowles, president, American Society of Hospital Pharmacists; and Donald C. Brodie, of the University of California.

The second symposium on the content of the specialized education program for hospital pharmacists explored the over-all program, as well as details of the educational requirements that are so important in a total medical care program.

A third symposium was directed to the problem of developing and maintaining sound drug therapy trends and standards. L. C. Miller, director of revision of the U. S. Pharmacopoeia; J. L. Powers, chairman, Committee on National Formulary; Robert T. Stormont, secretary, Council on Pharmacy and Chemistry of the American Medical Association; J. Roy Doty, secretary, Council on Dental Therapeutics of the American Dental Association; and L. C. Zopf, State University of Iowa, participated. Attention was directed to the danger that standards now carried out through professional agencies and the industry might be taken over by governmental agencies, and that government control might seriously impede the rapid progress that has been made in the advancement of drug therapy.

The original papers based on research varied from reports on the rates of release of medicaments from various bases to the physiological effects of such compounds, and from efforts to produce more efficient and effective diagnostic agents to the production of safe sterile water for injection, and the measurement of excretion of drug products in milk through isotopic tracer techniques.

GLENN L. JENKINS, *Secretary*

Alpha Epsilon Delta (N4)

The role of the humanities and the social sciences in the premedical program and their contributions to medical education were discussed at the symposium sponsored by Alpha Epsilon Delta, national premedical honor society, in cooperation with Sections Nm, K, and Q. About 100 persons enjoyed a spirited discussion following the excellent presentations of the speakers. In view of the interest in this subject, arrangements have been made for the publication of the symposium papers as a unit in an early issue of *The Scalpel*. Copies will be available to all interested persons on request.

A luncheon was held at the Statler prior to the symposium for those interested in the activities of Alpha Epsilon Delta. Plans were discussed for other meetings of premedical and medical educators, as urged by the national conference, so that each may acquire a better understanding and appreciation of their mutual problems and, together, work out and develop a better program of medical education.

Alpha Epsilon Delta will hold its national convention in the spring of 1954, probably in the Midwest. A luncheon program will be arranged for the Boston meeting of the AAAS in 1953.

MAURICE L. MOORE, *National Secretary*

American Association of Hospital Consultants (N7)

The American Association of Hospital Consultants held a symposium on "Science and Medical Care" on Dec. 28. On the program, which was planned for a mixed audience of men of science and of physicians in the overlapping area of their activities, Robert A. Moore, of the Washington University Medical School, spoke on "Planning for the Basic Sciences in the Hospital;" David Littauer, director of the Jewish Hospital of St. Louis, spoke on "Planning for the Mechanical Sciences in the Hospital;" and E. M. Bluestone, president of the American Association of Hospital Consultants, spoke on "Planning for the Clinical Sciences in the Hospital." Frank R. Bradley, director of the Barnes Hospital of St. Louis, was in the chair, and Herman Smith, hospital consultant, led the discussion. A small but deeply interested group participated, and everyone came away with the feeling that an excellent beginning had been made in establishing a sound relationship between the world of science in general and of medical practice in particular.

Dr. Moore stressed the educational purpose of the hospital and the relation of the basic sciences to its manifold activities. He held that the scientific activities of a hospital revolve around its laboratories, and urged stronger support of this kind of service. Dr. Littauer reviewed recent contributions to the mechanical sciences of the hospital, made a number of suggestions for future effort, and stressed the possibilities for the comfort and cure of the patient. Dr. Bluestone made a strong plea for the practice of medicine as a science in the combined fields of sociology and clinical medicine. He reviewed the shortcomings of modern medical practice and asked for better selection and classification of medical talent, insisting that it be put to the best possible use. He called particular attention to the consideration of the bed and of the patient who occupies it, as laboratories that are in themselves on a par with the centralized laboratories.

The enthusiasm of the audience gave promise that the next joint meeting in Boston will help bring these activities closer to each other as their relationships are placed on a firm basis.

E. M. BLUESTONE, *President*

Survey of Physiological Science (N10)

The symposium on "Education in Physiological Science" was held under the auspices of the Survey of Physiological Science, which the American Physiological Society is conducting for the National Science Foundation. Approximately 40 persons attended each of the two sessions on Dec. 28. The papers in the first session reported on the scope of the survey (Reynolds), the extent of the teaching of physiology in undergraduate courses (Baker, Solinger), and the relation of the physiological point of view to the training of zoologists and botanists (Prosser, Goddard). At the evening session the papers re-emphasized the scope of physiological science and its importance in the professional training of teachers (Gerard), of engineers (Taylor), and of medical clini-

cians and investigators (Comroe). The need for public education was also emphasized as important for the support of physiological experimentation and wider understanding of the principles underlying the functioning of living organisms (Visscher).

Following each of the sessions there was a full hour of discussion, which included remarks on the desirability of integrated undergraduate biology courses emphasizing the relationships, rather than the differentiations, of botany, zoology, and physiology. It was noted that some of the difficulties encountered in setting up and maintaining the standards of such courses stemmed from the narrowness or breadth of point of view the faculty had acquired in their own background of training, and that the most truly integrated courses depended largely upon the intellectual integration of the faculty members themselves. This topic led in turn to a discussion of the scope of the membership of the several professional societies.

There was also an indication that, in the smaller colleges and at the secondary level, it is difficult to find biological science teachers who have sufficient training and impetus to keep themselves and their students abreast of current developments in theory and emphasis, with the result that the content of much elementary instruction is obsolete. As an example, cellular physiology in particular is rarely treated.

Apparent limitations on some undergraduate programs in physiology arise from stated or implied requirements of the medical schools. Although some colleges are completely uninhibited by medical school requirements, others—particularly smaller institutions unable to offer a variety of courses because of the many demands on a small faculty—have been affected even to the extent of reducing instruction for nonpremedical students.

In view of the increasing recognition that physiological science has permeated many fields of both pure and applied science, there was considerable discussion of the need for disseminating sound, yet palatable, information to the general public. Based on reactions to programs already presented, which utilized the dramatic phenomena of physiological investigation in the laboratory, it was indicated that educational TV programs showing the functioning of living organisms hold the greatest promise for effective mass education.

Appropriate parts of this symposium may be reviewed and extended at the meeting of the Federation of American Societies for Experimental Biology, which is to be held in Chicago, Apr. 6–10, 1953.

W. G. LAND, *Survey of Physiological Science, American Physiological Society*

Section on Agriculture (O)

The program of Section O consisted of a joint symposium with Section K on "Combined Resource Development with Special Reference to the Missouri Valley." Although the papers dealt primarily with the Missouri Valley, much of their substance could apply to other areas or be used as a pattern for a similar study in other conservation areas. The material presented was of fundamental value and did not contain the elements of propaganda or local bias.

Both soil and mineral resources were described, and their utilization in the development of the region was discussed. Natural vegetation and its relationship to climate and soil conditions were considered, and the contributions that both timber and grass could make under proper management to the wealth and water resources of the valley were set forth. Possibilities and hazards of an enlarged agricultural development of the drainage basin were analyzed in detail. Because water in excess causes severe floods, and in insufficient amounts results in restricted output of both agricultural and manufactured products, the problems of water supply and control were dealt with thoroughly. The relationships of raw materials, of the amount and cost of power both present and potential, and of population in the development of industry in the valley were outlined, as were the sources of capital. In dealing with so large an area certain developments for the general good must be financed largely by federal funds, although utilization of private capital is desirable to the fullest possible extent. The administration of the development of so large an area, involving so many states, is an intricate problem, and the advantages and limitations of several methods were brought out.

Attendance at the sessions was approximately 30, which was in no way commensurate with the scope of the problems discussed or with the excellent content of the papers presented. The symposium was concluded with a lively two-hour discussion period.

C. E. MILLAR, *Secretary*

Section on Industrial Science (P)

The second annual meeting of the Section on Industrial Science was held in St. Louis on Dec. 30. The general theme of the program was "Effective Utilization of Industrial Manpower."

In the morning session modern industry was evaluated in terms of how scientific are industrial operations. Howard I. Young, president of American Zinc, Lead & Smelting Company, presided. The first discussion, by Harrison A. Roddick, of McKinsey & Company, management consultants, evaluated top management and pointed out many management and administrative problems and how they may be approached scientifically. It was of interest, also, to note what has happened in such situations when basic scientific principles are not applied. Research was appraised by Frank C. Croxton, of Battelle Memorial Institute, who pointed out many problems arising from limitations on personnel, budgets, and the like. It was demonstrated that certain scientific principles, if applied in the field of research, will make available personnel and facilities more effective. S. V. Hartman, of Aluminum Ore Company, in evaluating production, told of the many scientific developments that have increased production in various industrial areas. An evaluation of sales was given by Franklin J. Cornwell, manager of the Franchise Division of Brown Shoe Company. Mr. Cornwell stressed the need for scientific principles in appraising and developing markets, and indicated the unlimited work that can be done now and in the future in establishing markets for new products and their various consumer groups.

The highlight of the meeting was the section luncheon and the talk presented by Clark Hungerford, president of the St. Louis–San Francisco Railway Co. Mr. Hungerford who discussed "Science and Technology on the Railroads," covered a broad section of railroad operations, ranging from the early development of locomotives and rails to the present exploratory use of television for moving freight cars in the yards. From general comments made after the luncheon, it seems highly probable that many of those who heard this talk came out with a lot of "railroading in their blood."

The afternoon session was concerned with the "Effective Utilization of Industrial Manpower." Morris A.

Viteles, of Philadelphia Electric Company, discussed the contributions of psychology, analyzing the reasons why employees like or dislike their work and why they become effective or casual workers. Apparently a great deal can be done in increasing the productive ability of the individual or group by applying sound principles of psychology, both through the analysis of worker attitude and through the improvement of his reaction toward management and the company for which he works. The paper covering contributions of engineering was prepared by H. B. Maynard, of the Methods Engineering Council, and was read by C. E. Davies, of the American Society of Mechanical Engineers. It described the contributions that have been made in the field of engineering and the application of engineering principles to manpower problems. The contributions of medical research and practice were discussed by E. A. Irvin, medical director of the Cadillac Motor Car Division of General Motors Corporation. Dr. Irvin pointed out how a good medical program can be employed to utilize the services of various kinds of personnel, as well as to increase the productive ability of the employee group as a whole.

N. V. HENDRICKS, *Secretary*

American Industrial Hygiene Association (P1)

The second interim meeting of the American Industrial Hygiene Association with the AAAS consisted entirely of joint sessions, one with Subsection Nm and Section P, and three comprising a symposium on "Health Hazards and Health Protection" with Subsection Nm, Section M, and Section P. AIHA was gratified to be able to share its viewpoints with members of related societies. Because this was an intetim meeting no business was conducted. The annual conference of AIHA will be held in Los Angeles at the Hotel Statler, Apr. 20–23, 1953.

HENRY F. SMYTH, JR. *Executive Secretary*

Society for Industrial Biology (P2)

The Society for Industrial Microbiology held its December meeting at St. Louis Dec. 27–28. The Saturday sessions were devoted to a symposium covering the general subject of "Industrial Microbiology." The two sessions held on Sunday consisted of contributed papers and covered a wide area of interest in the industrial microbiological field.

At the conclusion of the Sunday afternoon session a short business meeting was held, at which time announcement was made of the newly elected officers for 1953: president, Kenneth B. Raper, Department of Bacteriology, University of Wisconsin; vice president, M. M. Baldwin, Battelle Memorial Institute; director for three years, G. W. Martin, Department of Botany, University of Iowa. Tentative plans were made at this meeting for the organization of a Midwest section.

Members of the society participated in the symposia and general program offered by Section P. John S. Karling was chairman of the Program Committee for the society, but J. E. McClary, a member of the program committee and representative of the society on local arrangements, contributed much to the success of the meeting and to the excellence of the program.

All sessions were well attended, and discussions following the papers were spirited. The AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE should be congratulated for making every facility available. The society expresses its thanks for these efforts.

C. L. PORTER, *Secretary*

Section on Education (Q)

Section Q held six sessions at the St. Louis Meeting, in addition to cosponsoring, with Alpha Epsilon Delta, a symposium on "The Social Sciences and Humanities in Medical Education." Attendance at the sessions ranged from 15 to 60, but at only one session was it fewer than 24. It was planned to keep the number of papers down so that there could be time to discuss them, and the discussion periods were especially well received.

For the third year, N. Franklin Stump arranged a panel on "Visual Performance in Engineering in Industry"— adding to the title this year, "and in the School." The panel met for two sessions and aroused keen interest. A symposium on the "New York Regents Examinations in Science" also attracted a sizable audience, with active participation in the discussion.

Particularly important was the symposium on "Current Criticisms of Public Education and How to Meet Them." Although this was held Wednesday morning after most of the convention had been finished, about 50 persons were present—many of them outside the field of professional education. Attacks by avowed enemies of the schools, as well as those by those in academic circles, were considered. The discussion was spirited but temperate.

D. A. WORCESTER, *Secretary*

AAAS Cooperative Committee on the Teaching of Science and Mathematics (Q1)

The symposium on "Identification of Talented Youth in Science and Mathematics," sponsored by the AAAS Cooperative Committee on the Teaching of Science and Mathematics, was well attended and evoked considerable audience participation in a discussion of the problems of identifying high school students with high potential for science and mathematics and of providing the opportunities for their development. The symposium was an outgrowth of a conference on the same subject held in November under the joint sponsorship of the Cooperative Committee and the U. S. Office of Education, and attended by approximately one hundred teaching scientists from all parts of the country. The results of this conference were reported in one of the papers of the symposium.

Officers of the Cooperative Committee for 1953 are Morris Meister, Bronx High School of Science, chairman, and Bernard B. Watson, Defense Manpower Administration, secretary. Dr. Meister and Dr. Watson also served in these same capacities during 1952.

BERNARD B. WATSON, *Secretary*

National Science Teachers Association (Q4)

For the fifth consecutive year, the National Science Teachers Association held its annual winter conference in conjunction with the AAAS and in cooperation with the other science teaching societies affiliated with the AAAS. The twelve separate sessions were attended by nearly 300 individuals. About 40 persons participated as speakers and panel members.

Especially well received was the general session extending through both morning and afternoon, Dec. 27. Following a presentation of his views on what constitutes "the principles of good teaching" in science by Francis D. Curtis, of the University of Michigan, 11 classroom teachers presented specific examples of techniques and activities for the implementation of the basic principles. A report of this symposium will appear in an early issue of *The Science Teacher*.

The general session at which panels of science teachers and representatives of book publishers discussed needs and problems in science text and reference books was also well received. It is expected that this symposium will likewise be reported in *The Science Teacher*.

The Business-Industry Section of NSTA held two sessions, one of which was the annual business meeting, at which Edmund Speare, of the Bituminous Coal Institute, was chosen section chairman for 1953.

In actions taken by the Executive Committee of NSTA, it was decided to continue the joint conference with AAAS at Boston in 1953; the 1954 national convention of NSTA was scheduled for Apr. 1–3 at the Hotel Morrison in Chicago (the 1953 convention will be held at the William Penn Hotel in Pittsburgh, Mar. 19–21); and it was agreed to recommend to the NSTA Board of Directors certain constitutional revisions that will modify the structural organization of the Association.

ROBERT H. CARLETON, *Executive Secretary*

Academy Conference (X1)

The Academy Conference held its annual meeting at the Hotel Jefferson on Dec. 28. This, the first meeting of the conference under its new constitution, had an attendance of 45, including representatives of 29 academies and 11 guests—the largest attendance and widest representation in the history of the organization.

At the business meeting, presided over by Austin R. Middleton (Kentucky Academy), amendments to the constitution were proposed to provide for the appointment of an archivist and to change the title of secretary to secretary-treasurer. It was voted to appoint a committee to draft bylaws and rules of order. Reports from Percival Robertson (Illinois Academy), chairman of a Committee on Cooperation among Academies of Science, and from F. E. E. Germann (Colorado-Wyoming Academy), chairman of a Committee on Cooperation of the Academies of Science with the Academy Conference, were presented. The retiring past president, Clinton L. Baker (Tennessee Academy), who had been appointed a committee of one to perform the duties of an archivist, presented a "History of the Academy Conference," bound mimeographed copies of which were distributed.

Wayne Taylor (Texas Academy) was named president-elect for 1953, and Leland H. Taylor (West Virginia Academy) was re-elected secretary. In accordance with the constitution, Austin R. Middleton now becomes past president, and Percival Robertson becomes president.

The program consisted of round-table discussions of "Responsibilities of Academies of Science in Promoting Improvement in the Teaching of Science in the Public Schools," led by Greta Oppe (Texas Academy); "The Relations of Academies of Science to College Students," conducted by Harold R. Wanless (Illinois Academy); "The Relations of Academies of Science to the Public," led by Harold E. Wilcox (Alabama Academy); and "The Relations of Academies of Science to the Press," by Watson Davis (Washington Academy). Discussions were lively and informative, and participation was general.

Out of the several reports and discussions it appeared that the following recommendations might well be carried back by delegates to their academies: (1) Academies should be urged to invite neighboring academies to send representatives to their own annual meetings; (2) the report of the delegate to the Academy Conference should have a prominent place in the meeting of each academy; (3) academies should encourage industrialists to take a more active part in their programs and their work; (4) academies should increase and improve their efforts to disseminate science to the layman through press, radio, and television; (5) many academies might profitably increase the activities of junior and collegiate academies; (6) better relations with the press are desirable for many academies, especially in providing reporters with facilities for adequate reporting.

The annual conference dinner was followed by an address by Paul E. Klopsteg, of the National Science Foundation, on "The Making of Awards and Grants by the National Science Foundation."

LELAND H. TAYLOR, *Secretary*

American Nature Study Society (X4)

Undoubtedly one of the highlights of the annual meeting of the American Nature Study Society was the joint field trip with the NABT to the Mississippi-Missouri River flood plains. Four bus loads of people had a most enjoyable day tramping over the area, which has recently been so drastically changed by the action of the rivers, and noting the ecological adaptations that have taken place. Of equal interest was the afternoon in the Busch Wildlife Area maintained by the Missouri Conservation Commission.

The presidential address by Roger Tory Peterson on Dec. 27, was illustrated with color movies of his European bird adventures. Dr. Peterson stressed the role of public education in attitudes of the layman toward outdoor activities and conservation. He found the people of England and Northern Europe—where TV, radio, movies, magazines, and newspapers all cooperate in bringing this kind of education to the public—even more interested than the people of America. But he found total indifference and destruction the rule of the day in Southern Europe, where these facilities are not utilized.

On Dec. 29, the panel session on "Presenting Nature and Conservation through the Major Mediums of Public Enlightenment," was of particular interest in the light of President Truman's remarks on Dec. 27. Newspapers, magazines, and radio were represented.

The panel discussion and demonstration on "Getting Better Results from Nature Photography," on Dec. 20, brought help and worth-while suggestions to everyone, whether beginner or veteran, amateur or professional, specialist in color or black and white, stills or movies.

Officers elected were: president, Roger Tory Peterson; vice president, Ruth Hopson; secretary, Helen B. Ross; treasurer, Gilbert Mouser; Board of Directors: William Gould Vinal, H. Raymond Gregg, Theodore Eckert, Dorothy Miller Matala, H. Seymour Fowler, Eva L. Gordon, Charles E. Mohr, Edwin Way Teale, Richard L. Weaver, and Richard Westwood.

HELEN B. ROSS, *Secretary*

Conference on Scientific Editorial Problems (X6)

The first Conference on Scientific Editorial Problems was attended by 75 persons, representing all phases of scientific writing, editing, and publishing. Six speakers, prominent in various branches of scientific editorial work, presented an excellent and stimulating series of addresses. The speakers included: Albert Joyce Riker, University of Wisconsin, "Standardization of Literature Citations;" Jaques Cattell, Science Press, "Offset Lithography;" Gertrude Mary Cox, The Consolidated University of North Carolina, "Role of Statistics in Technical Reports;" Leslie E. Neville, Armed Services Technical

Information Agency, Department of Defense, "Problems of Documentation in the Department of Defense;" George Scielstad, Applied Physics Laboratory, The Johns Hopkins University, "Format of Technical Reports;" and A. E. Tyler, U. S. Naval Ordnance Test Station, China Lake, Calif., "Technical Reporting in a Naval Research and Development Establishment." One feature of the conference was a fruitful discussion, which included questions to the speakers and a free exchange of ideas.

Last item on the program was a brief business meeting. The conference resolved that its meetings would be a permanent part of the AAAS annual conventions. Marian Fineman was unanimously elected chairman of the group, which will meet again in Boston in 1953. Mrs. Fineman appointed a steering committee consisting of the six speakers and Jonathan N. Leonard, science editor of *Time* magazine.

MARIAN FINEMAN, *Chairman*

National Association of Science Writers (X7)

Scientific vs. journalistic accuracy was discussed by Edgar Anderson, Washington University botanist, and Harold T. Meek, news editor of the St. Louis *Post-Dispatch*, at the 1952 meeting of the National Association of Science Writers. Dr. Anderson, who is also assistant director of the Missouri Botanical Garden, expressed the belief that St. Louis newspapermen tended to worry too much about technical matters that do not concern the general public and thus missed points of more scientific significance. Mr. Meek stressed the importance of general assignment work as a means of training a science writer. He complained that many persons now writing about science for the press tend to trust scientists too much, frequently are inclined to exaggerate the importance of minor developments, and often oversimplify matters too greatly.

A lively discussion of both speakers' points followed the presentation of their papers. Volta Torrey, editor of *Popular Science Monthly*, presided in the absence of Earl English, of the University of Missouri School of Journalism, who had arranged the symposium.

At a business meeting of the association, which followed the symposium, the invitation of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE to meet with the AAAS in Boston, Dec. 26–31, 1953, was accepted. The first issue of a NASW newsletter, to be issued six times a year, was distributed at the St. Louis meeting. This newsletter, edited by John E. Pfeiffer, at the NASW headquarters in the New York Academy of Sciences, will contain special articles written by members of the organization and invited contributors, and will cover the activities of science writers in all parts of the U. S. The NASW now has 89 active and 80 associate members, and will celebrate the 20th anniversary of its founding in 1954. Its objectives are to foster the dissemination of accurate information regarding science through all media normally devoted to informing the public, and to interpret science and its meaning to society.

VOLTA TORREY, *President*

The Society of the Sigma Xi and The Scientific Research Society of America (X9)

The arrangements made at St. Louis for the 53rd annual convention of Sigma Xi and the evening address were entirely satisfactory. With reference to the two Sigma Xi functions, the convention was well attended. There were 89 delegates, representing 79 local groups. The annual address by D. M. S. Watson, on "Africa and the Origin of Man," was attended by very close to a thousand persons. Sigma Xi and RESA will probably meet with the AAAS at Boston next December, although a definite decision will not be reached until the spring meeting of the Executive Committee.

GEORGE A. BAITSELL, *Executive Secretary*

Scientific Book Register

Ciba Foundation Colloquia on Endocrinology. Vol. III, ***Hormones, Psychology, and Behavior, and Steroid Hormone Administration;*** Vol. IV, ***Anterior Pituitary Secretion and Hormonal Influences in Water Metabolism.*** G. E. W. Wolstenholme, Gen. Ed.; Margaret P. Cameron, Asst. New York: Blakiston; London: J. & A. Churchill, 1952. Vol. III: 380 pp. and plates; Vol. IV: 591 pp. and plates.

Advances in Carbohydrate Chemistry, Vol. 7. Claude S. Hudson, Melville L. Wolfrom, and Sidney M. Cantor, Eds. New York: Academic Press, 1952. 370 pp. $7.50.

Volume and Integral. Werner W. Rogosinski. Edinburgh–London: Oliver and Boyd; New York: Interscience, 1952. 160 pp. Illus. $1.75.

A Short Course in Organic Chemistry. Harold Hart and Roert D. Schuetz; Herman T. Briscoe, Ed. Boston: Houghton Mifflin, 1953. 326 pp. Illus. $4.50.

Congenital Anomalies of the Heart and Great Vessels. Maurice A. Schnitker. New York: Oxford Univ. Press, 1952. 306 pp. Illus.

Introduction to the Foundations of Mathematics. Raymond L. Wilder. New York: Wiley; London: Chapman & Hall, 1952. 305 pp. $5.75.

A Contribution to the Theory of the Living Organism. 2nd ed. W. E. Agar. Victoria: Melbourne Univ. Press; New York: Cambridge Univ. Press, 1951–52. 235 pp. $3.75.

Strikes—A Study in Industrial Conflict. With special reference to British experience between 1911 and 1947. K. G. J. C. Knowles. New York: Philosophical Library; London: Basil Blackwell, 1952. 330 pp. Illus. $8.75.

Regeneration and Wound-Healing. A. E. Needham. London: Methuen; New York: Wiley, 1952. 152 pp. Illus. $1.75.

Highway Research Board: Proceedings of the Thirty-First Annual Meeting, Vol. 31. National Academy of Sciences–National Research Council Pub. 238. Fred Burggraf, W. N. Carey, Jr., and Walter J. Miller, Eds. Washington, D. C.: Highway Research Board, NRC, 1952. 690 pp. Illus. $7.50.

Record of the Rocks: The Geological Story of Eastern North America. Horace G. Richards. New York: Ronald, 1953. 413 pp. Illus. $6.00.

Student Deferment in Selective Service: A Vital Factor in National Security. M. H. Trytten. Minneapolis: Univ. Minnesota Press; London: Geoffrey Cumberlege, Oxford Univ. Press, 1952. 140 pp. Illus. $3.00.

WILEY BOOKS

THE HUMAN SENSES

By FRANK A. GELDARD, *University of Virginia.* This clearly-written, copiously illustrated volume represents the first attempt at a descriptive account of man's senses, from a psycho-physiological standpoint. It treats each of the sense channels from the standpoint of 1) physics of stimuli, and 2) anatomy and physiology of the sense organ. Chapters on the cutaneous senses are particularly valuable because this area is so often neglected in psychological and physiological literature. **1953. 365 pages. $5.00.**

OUTLINES OF STRUCTURAL GEOLOGY, Third Edition

By E. SHERBON HILLS, *University of Melbourne, Australia.* The third edition of this well-known book has been expanded to incorporate discussions of topics which have grown in importance since the publication of the first edition. There are new illustrations for the new text, and revisions of outmoded concepts. The importance of rock-deformation in the soft-rock state has been emphasized. The chapter on major crystal structures has been entirely revised, as has the treatment of cleavage, especially in slates. **In Press.**

EXPERIMENTAL NUCLEAR PHYSICS, Volumes I and II

Edited by EMILIO SEGRÈ, *University of California.* Written by a veritable WHO'S WHO in Nuclear Physics, these two books are patterned after the classic German Handbooks. They have a threefold purpose: 1) to present the modern experimental techniques, 2) to point out the truly significant facts and data, and 3) to indicate the broad lines of present-day theoretical interpretation. Each section of each volume is written by an internationally acknowledged authority on the particular subject under discussion and is supported by valuable footnotes, tables, references, and indexes. Volume I. **Ready in March. Approx. 776 pages. Prob. $14.00.** Volume II. **Ready in August.**

ION EXCHANGERS IN ANALYTICAL CHEMISTRY

By OLOF SAMUELSON, *Chalmers Institute of Technology, Göteborg, Sweden.* Here is the first book of its kind to be devoted to the analytical applications of the new synthetic organic ion exchangers. It is a comprehensive study of the ion exchange method from the viewpoint of a practicing analytical chemist. It gives the techniques and the practical applications of this new method, as well as a discussion of the fundamental physical principles involved. **1953. 310 pages. $6.50.**

ELEMENTS OF CARTOGRAPHY

By ARTHUR H. ROBINSON, *University of Wisconsin.* Here is a new book that presents map-making as a science and an art. No mere "catch-all" of things cartographic, the book is aimed at medium and small-scale map-making and approaches the subject from the point of view of principles and their practical applications, rather than from the purely theoretical standpoint. Many new techniques developed under the pressure of war-time necessity are incorporated into this complete, well organized, and readable presentation. **1953. Approx. 262 pages. Prob. $7.00.**

RADIATIONS AND LIVING CELLS

By FREDERICK GORDON SPEAR, *Strangeways Research Laboratory, Cambridge.* This book is a first attempt to give, from the experimental angle, a concise account of the effect of penetrating radiation on normal and diseased tissues in man. It is written for those who are interested in the ever widening frontier between physics and biology, particularly that part of the frontier concerned with medical physics and radiation biology. **In Press.**

AN INTRODUCTION TO LINEAR PROGRAMMING

By A. CHARNES, W. W. COOPER, *and* A. HENDERSON, *all at the Carnegie Institute of Technology.* This new book makes clear the methods of linear programming at a variety of levels. A simple, concrete numerical problem is developed with accompanying explanations and economic interpretations. The problem illustrates a characteristic industrial application in such fashion that the tools of economic analysis and common sense can be used in the solution. **1953. 84 pages. Prob. $2.50.**

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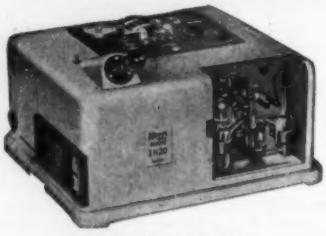

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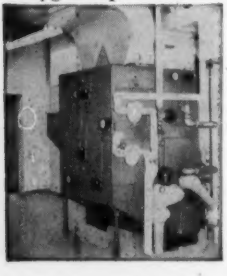

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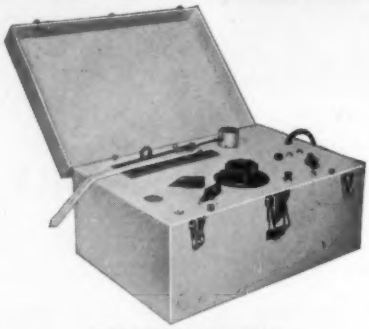

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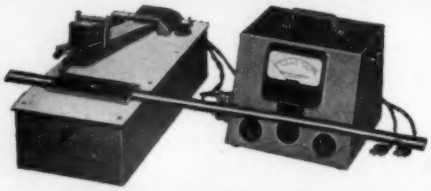

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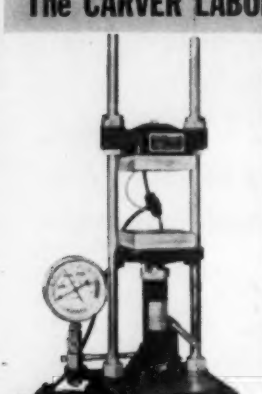

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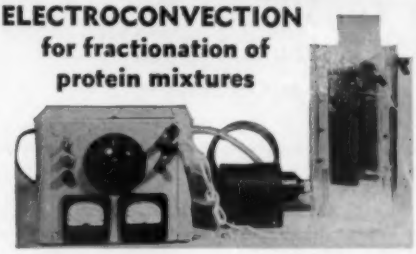

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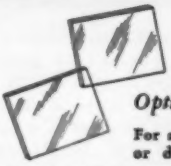

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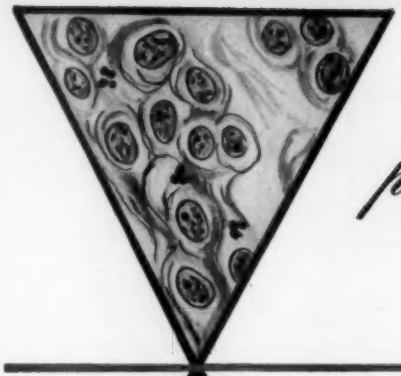

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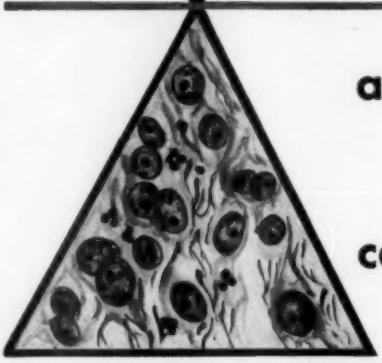

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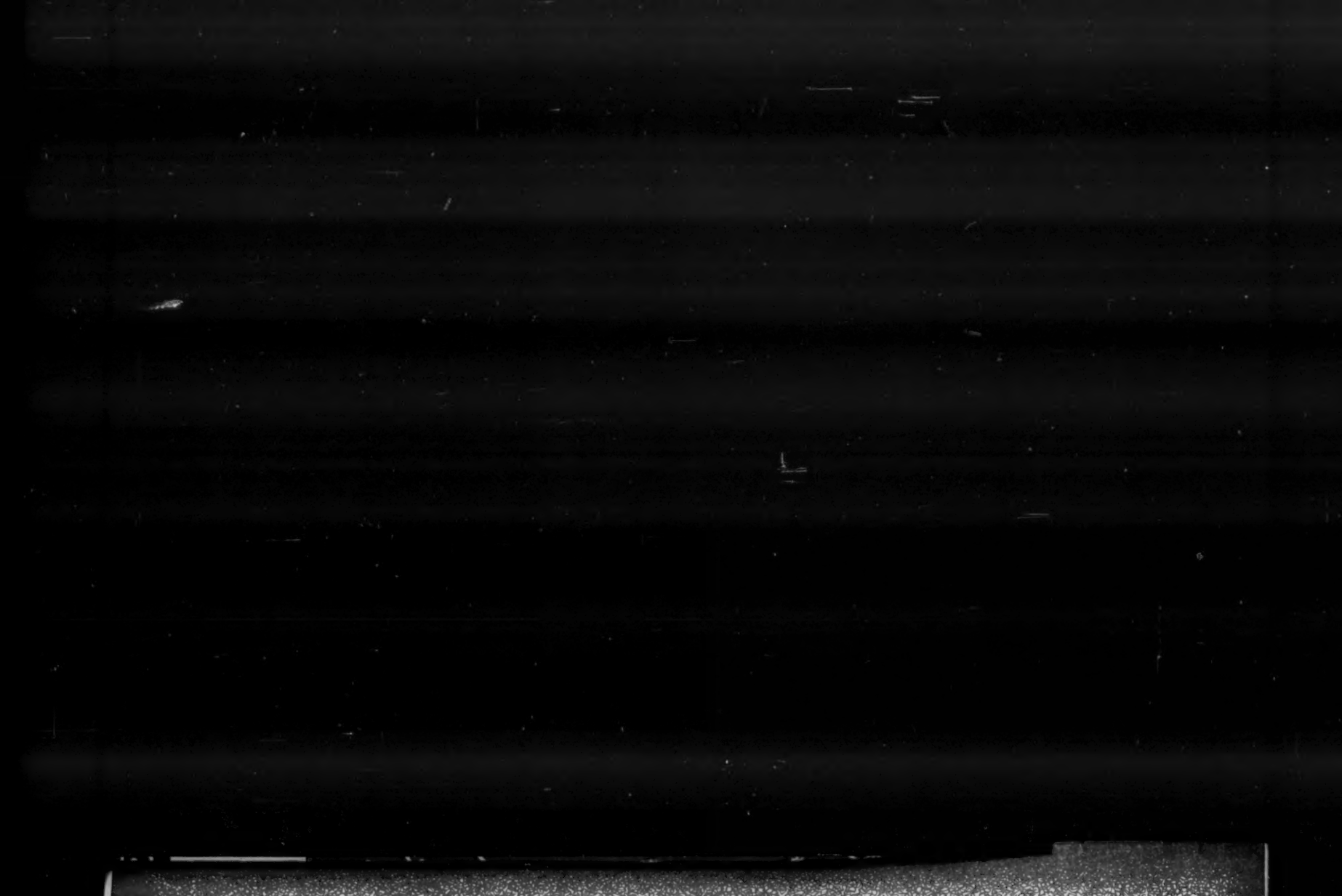
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